ORDER NO. MAC9903022C3

Service Manual

Room Air Conditioners

CS-A181KR / CU-A181KR
CS-A241KR / CU-A241KR

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Panasonic

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⚠ WARNING

This service information is designed for experienced repair technicians only and is not designed for use by the general public. It does not contain warnings or cautions to advise non-technical individuals of potential dangers in attempting to service a product. Products powered by electricity should be serviced or repaired only by experienced professional technicians. Any attempt to service or repair the product or products dealt with in this service information by anyone else could result in serious injury or death.

Features

- **High Efficiency**
- **High Efficiency Airflow Circuit**
- **Compact Design**
- **Removable and Washable Front Panel**
- **Auto Restart after Power Failure**
- **Long Piping up to 25m**
- **Deodorizing Air Filter**
- **Deodorizing Control during operation**
- **Cold draught Control**

Functions

Remote Control

OFF / ON ⏻

Operation OFF / ON

MODE

Operation Mode Selection

- AUTO Automatic Operation Mode
- HEAT Heating Operation Mode
- COOL Cooling Operation Mode
- DRY Soft Dry Operation Mode

FAN SPEED

Indoor Fan Speed Selection

- Low Speed
- Medium Speed
- High Speed
- AUTOFAN Automatic Fan Speed

AIR SWING

Airflow Direction Control

- SWING Automatic Airflow Direction Control
- MANUAL Airflow Direction Manual Control

TEMP.

Room Temperature Setting

- Temperature Setting (16˚C to 30˚C)
- Automatic Operation
  - ◄ 2˚C lower than standard
  - Standard
  - ► 2˚C higher than standard

ON-TIMER
OFF-TIMER

Timer Operation Selection

- 24-hour, OFF / ON Real Timer Setting.

TIME

Time / Timer Setting

- Hours and minutes setting.

SET
CANCEL

Timer Operation Set / Cancel

- ON Timer and OFF Timer setting and cancellation.

CLOCK
(時計)

Clock Setting

- Current time setting.

SLEEP

Sleep Mode Operation OFF / ON

Functions

Indoor Unit

POWER ⏻

Power Switch OFF / ON

AUTO OFF / ON

Auto Operation Switch

- Used when the remote control cannot be used.

Remote Control Signal Receiving Sound Control

- It can be controlled by pressing Auto Operation Switch for 10 seconds.

TEST RUN OFF / ON

Operation Test Running / Pump Down Switch

- Used when test running or servicing.

Operation Indication Lamps (LED)

- POWER (Red)..... Lights up in operation, blinks in Automatic Operation Mode judging and Hot Start operation.
- SLEEP (Orange)..... Lights up in Sleep Mode Operation.
- TIMER (Orange)..... Lights up in Timer Setting.

Operation Mode

- Heating, Cooling, Soft Dry, and Automatic Mode.

Time Delay Safety Control

- Restarting is inhibited for appro. 3 minutes.

7 Minutes Time Save Control

- Cooling Operation only.

Auto Restart Control

- Operation is restarted after power failure at previous setting mode.

Anti-Freezing Control

- Anti-Freezing control for indoor heat exchanger. (Cooling and Soft Dry)

Sleep Mode Auto Control

- Indoor Fan operates at Super Low fan speed.
- Operation stops after 8 hours.

Indoor Fan Speed Control

- High, Medium and Low.
- Automatic Fan Speed Mode
  - Heating : Fan speed varies from Me → SLo in accordance with indoor heat exchanger.
  - Cooling : Fan rotates at Hi and Me speed. Deodorizing control is available.
  - Soft Dry : Fan rotates at SLo speed. Deodorizing control is available.

Airflow Direction Control

- Automatic air swing and manual adjusted by remote control for vertical airflow.
- Manually adjusted by hand for horizontal airflow.

Hot-Start Control

- The indoor fan stops until the indoor heat exchanger temperature over 30°C.
- The indoor fan operates at SLo and Lo⁻ when indoor heat exchanger temperature reaches 30°C ~ 42°C.
- Hot start is completed when indoor heat exchanger reaches 42°C.

Functions

Outdoor Unit

4-Way Valve Control

- When the unit is switched to "OFF" during Heating operation, 4-way valve stays at Heating Position for 5 minutes.

Overload Protector

- Inner protector (Compressor, Fan Motor).

60 Secs. Forced Operation Control

- Once the compressor is activated, it does not stop for 60 secs. (Stops immediately with remote control stop signal.)

Outdoor Fan Operation Control

- 4-pole induction motor (2-speed)
- For Cooling or Soft Dry Operation
  Hi-speed … when outdoor temperature reaches to 31°C
  Lo-speed … when outdoor temperature reaches to 29°C
- For Heating Operation
  Hi-speed ... when outdoor temperature reaches to 13.5°C.
  Lo-speed ... when outdoor temperature reaches to 15.5°C.
- For Over-heating Protection, the Fan is switched ON or OFF depending on the piping temperature and the outdoor temperature.

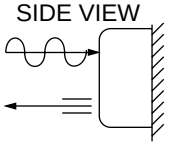
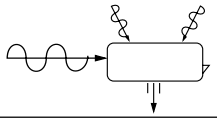
Deice Control

- To prevent frosting at outdoor heat exchanger during Heating Operation.

2-Way Valve Control

- 2-way valve is ON for 1 minutes after compressor start. Other than this, 2-way valve is OFF. (A241K only)

Product Specifications

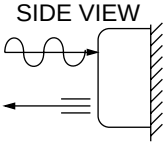
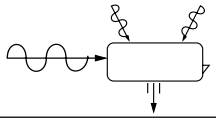
			Unit	CS-A181KR	CU-A181KR
Cooling Capacity			kW Btu/h	5.20 - 5.15 17,700 - 17,600	
Heating Capacity			kW Btu/h	6.20 - 6.15 21,100 - 21,000	
Moisture Removal			ℓ/h Pint/h	2.9 6.1	
Power Source			Phase V Cycle	Single 240 - 230 50	
Airflow Method			OUTLET INTAKE	SIDE VIEW 	TOP VIEW 
Air Volume	Indoor Air (Lo)		m^3/min (cfm)	Cooling ; 11.2 (395) Heating ; 11.6 (409)	–
	Indoor Air (Me)		m^3/min (cfm)	Cooling ; 12.4 (437) Heating ; 12.9 (455)	–
	Indoor Air (Hi)		m^3/min (cfm)	Cooling ; 13.7 (480) Heating ; 14.2 (500)	–
	Outdoor Air		m^3/min (cfm)	–	Cooling ; 11.8 (416) Heating ; 12.2 (430)
Noise Level			dB (A)	Cooling ; High 43 - 43, Low 38 - 38 Heating ; High 42 - 42, Low 38 - 38	Cooling ; High 56 - 56 Heating ; High 57 - 57
Electrical Data	Input		kW	Cooling ; 2.19 - 2.10 Heating ; 2.28 - 2.17	
	Running Current		A	Cooling ; 11.4 - 11.1 Heating ; 11.3 - 10.8	
	COP		W/W	Cooling ; 2.37 - 2.45 Heating ; 2.72 - 2.83	
	Starting Current		A	51	
Piping Connection Port (Flare piping)			inch inch	G ; Half Union 1/2" L ; Half Union 1/4"	G ; 3-way valve 1/2" L ; 3-way valve 1/4"
Pipe Size (Flare piping)			inch inch	G (gas side) ; 1/2" L (liquid side) ; 1/4"	G (gas side) ; 1/2" L (liquid side) ; 1/4"
Drain Hose	Inner diameter		mm	16	–
	Length		m	0.75	–
Power Cord Length Number of core-wire			m	2.1 3 (1.5 mm^2)	– –
Dimensions		Height	inch (mm)	11-7/16 (290)	26-31/32 (685)
		Width	inch (mm)	38-19/32 (980)	31-1/2 (800)
		Depth	inch (mm)	7-11/16 (195)	11-13/16 (300)
Net Weight			lb (kg)	29 (13)	137 (62)
Compressor		Type		–	Rotary (1 cylinder) rolling piston type
	Motor	Type		–	Induction (2-poles)
	Rated	Output	kW	–	1.7
Air Circulation		Type		Cross-flow Fan	Propeller Fan
		Material		AS + Glass Fiber 30%	PC + AES + Glass Fiber 15%
	Motor	Type		Transistor (4-poles)	Induction (4-poles)
		Input	W	61.9	139
		Rated Output	W	20	72
	Fan Speed	Low	rpm	Cooling ; 980 Heating ; 980	670 - 635
		Medium	rpm	Cooling ; 1,090 Heating ; 1,090	–
		High	rpm	Cooling ; 1,200 Heating ; 1,240	1,030 - 990

Product Specifications

		Unit	CS-A181KR	CU-A181KR
Heat Exchanger	Description		Evaporator	Condenser
	Tube material		Copper	Copper
	Fin material		Aluminium	Aluminium
	Fin Type		Slot Fin	Corrugated Fin
	Row / Stage		(Plate fin configuration, forced draft) 2 × 14	2 × 26
	FPI		21	14
	Size (W × H × L)	mm	732 × 294 × 25.4	769.2 732.9 × 660.4 × 44
Refrigerant Control Device			–	Capillary Tube
Refrigeration Oil		(cm^3)	–	SUNISO 4GDID or ATMOS M60 (700)
Refrigerant (R-22)		g (oz)	–	1,590 (56.1)
Thermostat			Electronic Control	–
Protection Device			–	Inner Protector
Capillary Tube	Length Flow Rate Inner Diameter	mm ℓ/min mm	– – –	Cooling ; 690 Heating ; 650 Cooling ; 13.0 Heating ; 20.9 Cooling ; 1.6 Heating ; 1.9
Air Filter	Material Style		P.P. Honeycomb	–
Compressor Capacitor		µF, VAC	–	35 µF, 370VAC
Fan Motor Capacitor		µF, VAC	–	3.0 µF, 400VAC

• Specifications are subject to change without notice for further improvement.

Product Specifications

			Unit	CS-A241KR	CU-A241KR
Cooling Capacity			kW Btu/h	6.45 - 6.40 22,000 - 21,800	
Heating Capacity			kW Btu/h	7.80 - 7.65 26,600 - 26,100	
Moisture Removal			ℓ/h Pint/h	3.8 8.0	
Power Source			Phase V Cycle	Single 240 - 230 50	
Airflow Method			OUTLET INTAKE	SIDE VIEW 	TOP VIEW 
Air Volume	Indoor Air (Lo)		m^3/min (cfm)	Cooling ; 13.1 (462) Heating ; 14.1 (497)	–
	Indoor Air (Me)		m^3/min (cfm)	Cooling ; 14.3 (504) Heating ; 15.4 (542)	–
	Indoor Air (Hi)		m^3/min (cfm)	Cooling ; 15.7 (550) Heating ; 16.9 (600)	–
	Outdoor Air		m^3/min (cfm)	–	Cooling ; 14.3 (504) Heating ; 15.4 (542)
Noise Level			dB (A)	Cooling ; High 47 - 47, Low 41 - 41 Heating ; High 46 - 46, Low 41 - 41	Cooling ; High 61 - 61 Heating ; High 62 - 62
Electrical Data	Input		kW	Cooling ; 3.08 - 2.95 Heating ; 3.16 - 3.05	
	Running Current		A	Cooling ; 15.7 - 15.6 Heating ; 14.7 - 14.2	
	COP		W/W	Cooling ; 2.09 - 2.17 Heating ; 2.47 - 2.51	
	Starting Current		A	66	
Piping Connection Port (Flare piping)			inch inch	G ; Half Union 5/8" L ; Half Union 1/4"	G ; 3-way valve 5/8" L ; 3-way valve 1/4"
Pipe Size (Flare piping)			inch inch	G (gas side) ; 5/8" L (liquid side) ; 1/4"	G (gas side) ; 5/8" L (liquid side) ; 1/4"
Drain Hose	Inner diameter		mm	16	–
	Length		m	0.75	–
Power Cord Length Number of core-wire			m	2.1 3 (2.5 mm^2)	– –
Dimensions		Height	inch (mm)	11-7/16 (290)	26-31/32 (685)
		Width	inch (mm)	38-19/32 (980)	31-1/2 (800)
		Depth	inch (mm)	7-11/16 (195)	11-13/16 (300)
Net Weight			lb (kg)	29 (13)	146 (66)
Compressor		Type		–	Rotary (1 cylinder) rolling piston type
	Motor	Type		–	Induction (2-poles)
	Rated	Output	kW	–	2.2
Air Circulation		Type		Cross-flow Fan	Propeller Fan
		Material		AS + Glass Fiber 30%	PC + AES + Glass Fiber 15%
	Motor	Type		Transistor (4-poles)	Induction (4-poles)
		Input	W	72.2	191.0
		Rated Output	W	30	108
	Fan Speed	Low	rpm	Cooling ; 1,100 Heating ; 1,200	720 - 680
		Medium	rpm	Cooling ; 1,200 Heating ; 1,320	–
		High	rpm	Cooling ; 1,320 Heating ; 1,410	1,200 - 1,170

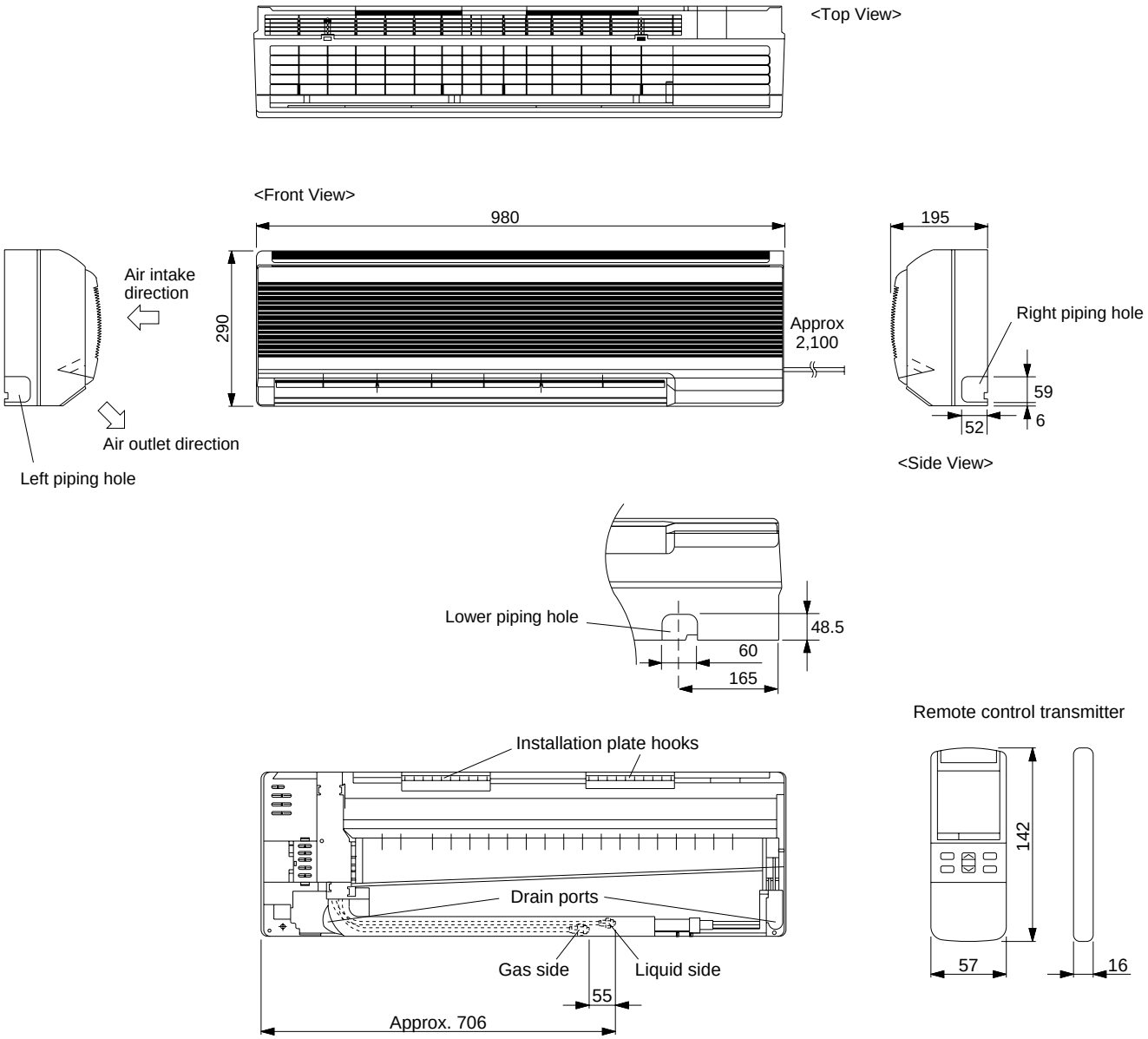
Product Specifications

		Unit	CS-A241KR	CU-A241KR
Heat Exchanger	Description		Evaporator	Condenser
	Tube material		Copper	Copper
	Fin material		Aluminium	Aluminium
	Fin Type		Slot Fin	Corrugated Fin
	Row / Stage		(Plate fin configuration, forced draft) 2 × 14	2 × 26
	FPI		21	16
	Size (W × H × L)	mm	732 × 294 × 25.4	769.2 732.9 × 660.4 × 44
Refrigerant Control Device			–	Capillary Tube
Refrigeration Oil		(cm^3)	–	SUNISO 4GDID or ATMOS M60 (1,130)
Refrigerant (R-22)		g (oz)	–	1,770 (62.5)
Thermostat			Electronic Control	–
Protection Device			–	Inner Protector
Capillary Tube	Length Flow Rate Inner Diameter	mm ℓ/min mm	– – –	Cooling ; 700 Heating ; 649 Cooling ; 17.5 Heating ; 27.0 Cooling ; 1.8 Heating ; 2.4
Air Filter	Material Style		P.P. Honeycomb	–
Compressor Capacitor		µF, VAC	–	50 µF, 370VAC
Fan Motor Capacitor		µF, VAC	–	3.0 µF, 450VAC

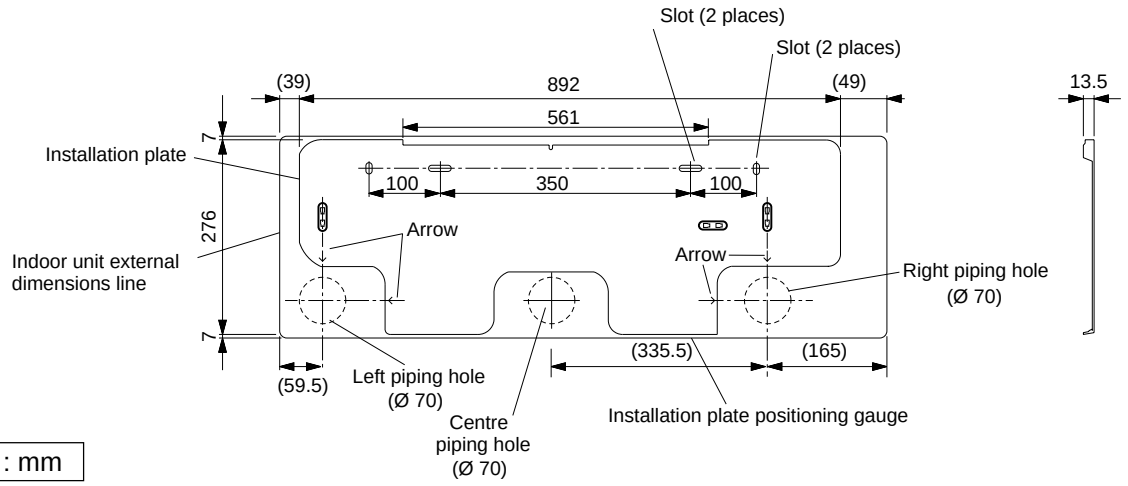
• Specifications are subject to change without notice for further improvement.

Dimensions

CS-A181K / CS-A241K



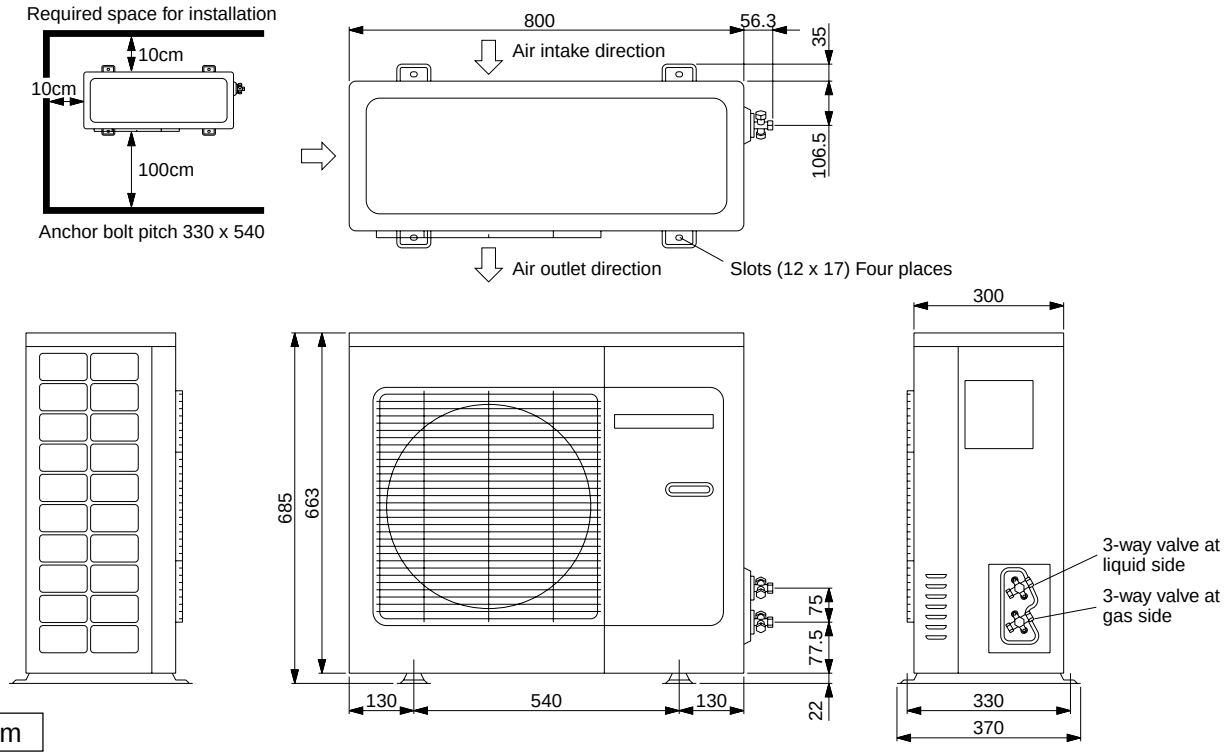
Relative position between the indoor unit and the installation plate <Front View>



Unit : mm

Dimensions

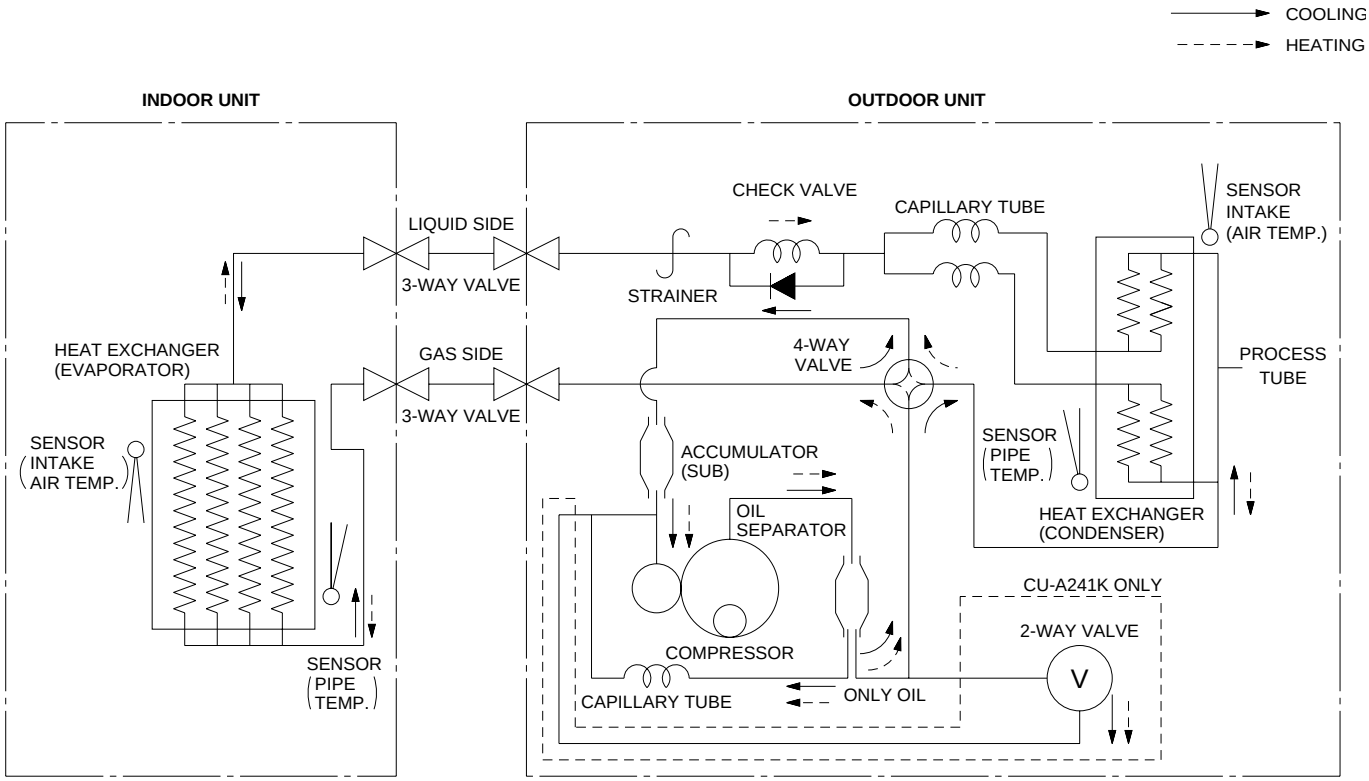
CU-A181K / CU-A241K



Unit : mm

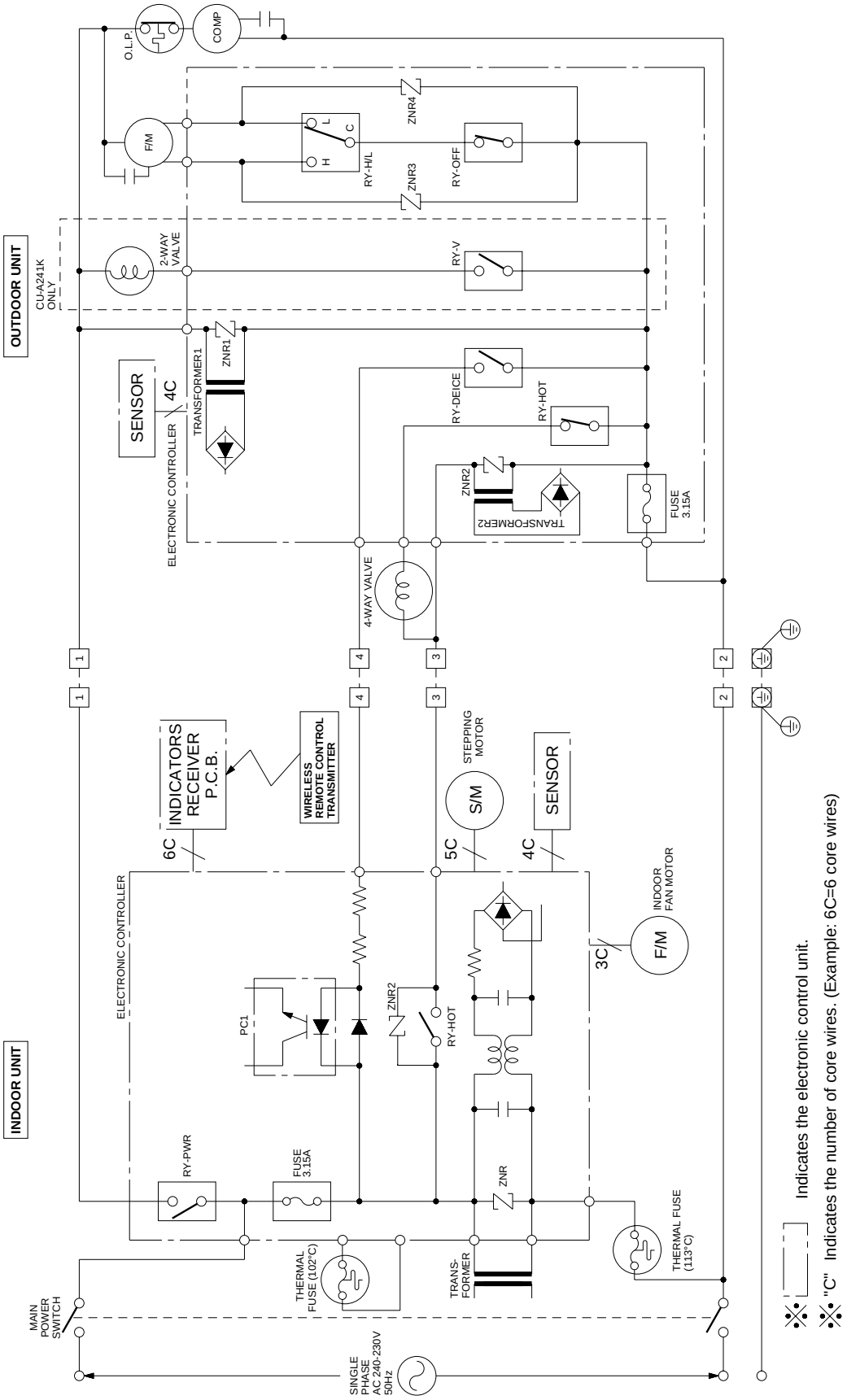
Refrigeration Cycle Diagram

CS/CU-A181K
CS/CU-A241K



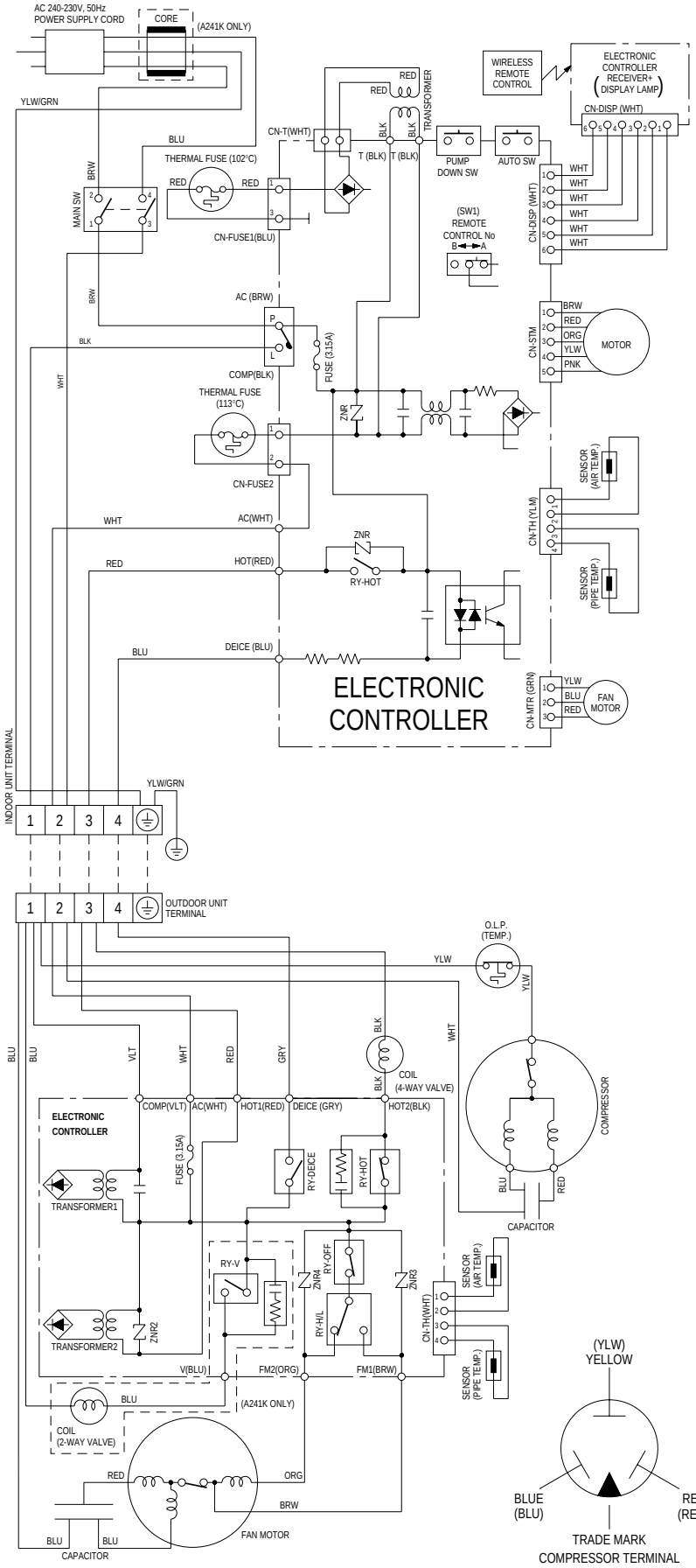
Block Diagram

CS-A181KR / CU-A181KR
CS-A241KR / CU-A241KR



Wiring Diagram

CS-A181KR / CU-A181KR
CS-A241KR / CU-A241KR



REMARKS:

BLU	:	BLUE
BRW	:	BROWN
BLK	:	BLACK
WHT	:	WHITE
RED	:	RED
ORG	:	ORANGE
PNK	:	PINK
YLW	:	YELLOW
GRN	:	GREEN
GRY	:	GRAY
VLT	:	VIOLET

Resistance of Outdoor Fan Motor Windings

	CU-A181KR	CU-A241KR
CONNECTION	CWA92294 (Ω)	CWA92295 (Ω)
BLUE - BROWN	79.5	46.8
BROWN - ORANGE	65.1	64.6
RED - BROWN	70.8	73.7

Resistance of Compressor Windings

	CU-A181KR	CU-A241KR
CONNECTION	2JS350D3AA02 (Ω)	2JS464D3AA02 (Ω)
C-R	0.980	0.888
C-S	3.929	2.328

Operation Details

1) Cooling Mode Operation

Cooling in operation according to Remote Control setting.

Time Delay Safety Control (3 minutes)

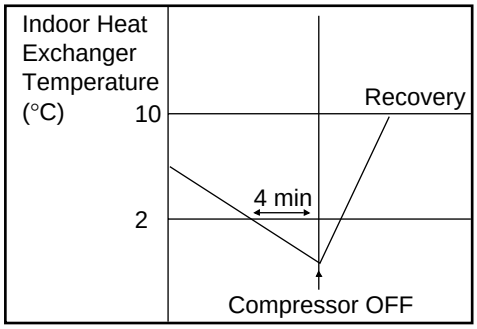
- When the compressor is stopped by Power Switch, Remote Control or there is a power failure, it restarts after 3 minutes when the Power Switch, Remote Control is turned ON or the power supply is resumed.
- When the setting temperature is reached during cooling operation, the compressor stops and it will not start for 3 minutes.

7 minutes Time Saved Control

- The compressor will start automatically if it has stopped for 7 minutes even if the room temperature is below the compressor ON temperature.

Anti-Freezing Control

- If the temperature of the indoor heat exchanger falls continously below 2°C for 4 minutes, the compressor turns off to protect the indoor heat exchanger from freezing. The fan speed setting remains the same.
- Compressor recommences when the indoor heat exchanger temperature rises to 10°C (Recovery).
  ※ 3 minutes waiting of Time Delay Safety Control is valid for Cooling Operation.

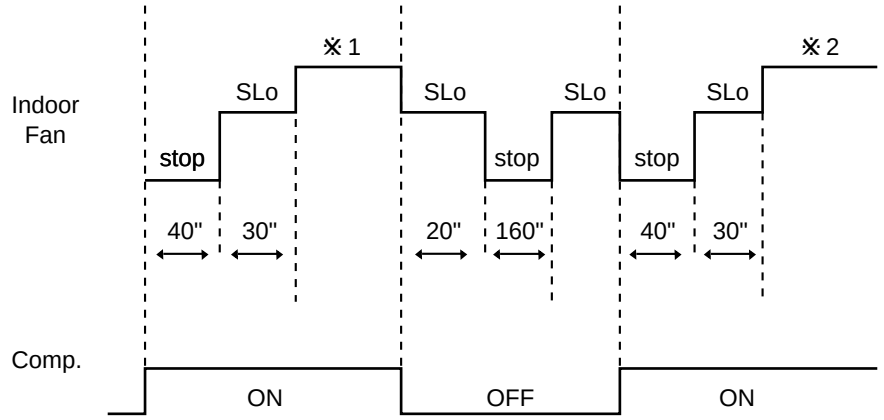


Operation Details

Automatic Fan Speed Mode

When Automatic Fan Speed is selected at Remote Control during cooling operation.

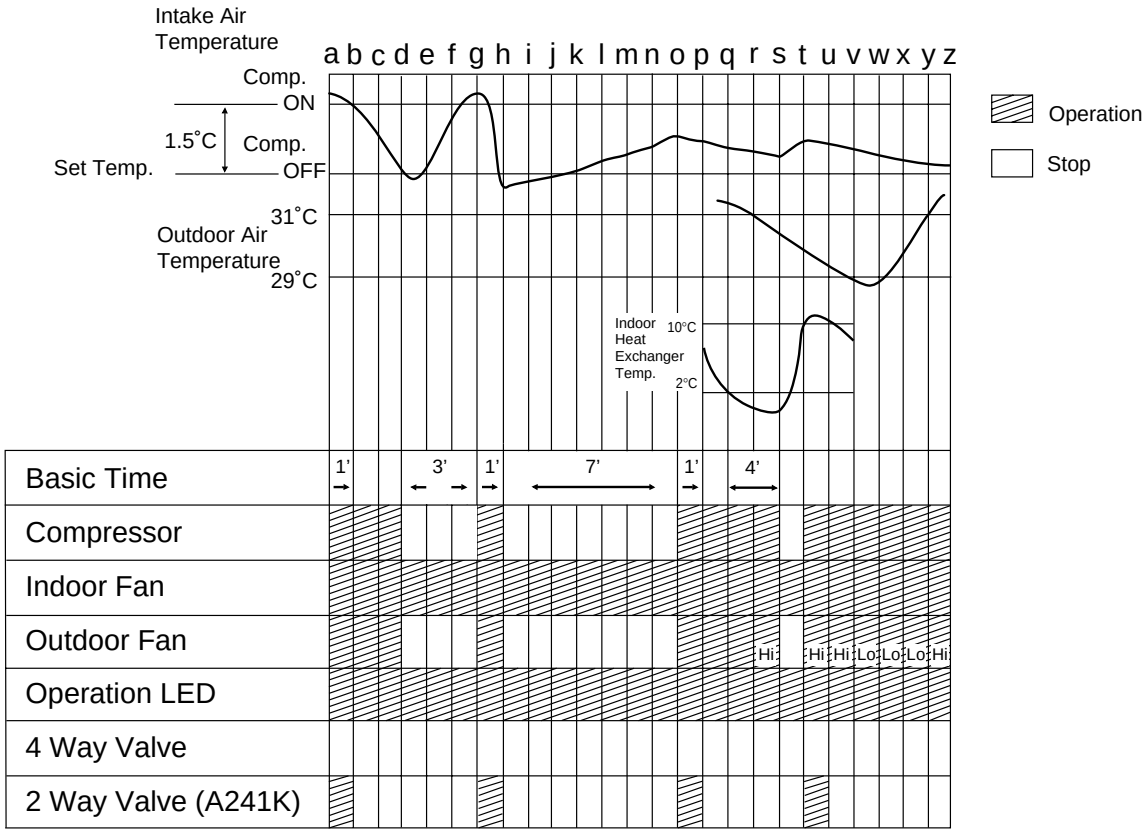
- Fan speed rotates in the range of Hi to Me.
- Deodorizing Control.



※1 Fan Speed is Hi until the compressor stops (when the room temperature reaches setting temperature).

※2 Fan Speed is Me after the compressor restarts.

Cooling Operation Time Diagram



<Description of operation>

d – g	:	Time Delay Safety Control (waiting for 3 minutes)
g – h	:	60 sec. Forced Operation
h – o	:	7 min. Time Saved Control
q – t	:	Anti Freezing Control
v – y	:	Outdoor Fan Control

Operation Details

2) Soft Dry Mode Operation

- The unit starts cooling operation until the room temperature reaches the setting temperature set on the Remote Control, and then Soft Dry operation will start.
- During Soft Dry operation, the Indoor Fan operates with SLo speed.
- Once room temperature reaches below Soft Dry OFF temperature. Indoor Fan, Compressor and Outdoor Fan Stop for 6 minutes.

Time Delay Safety Control

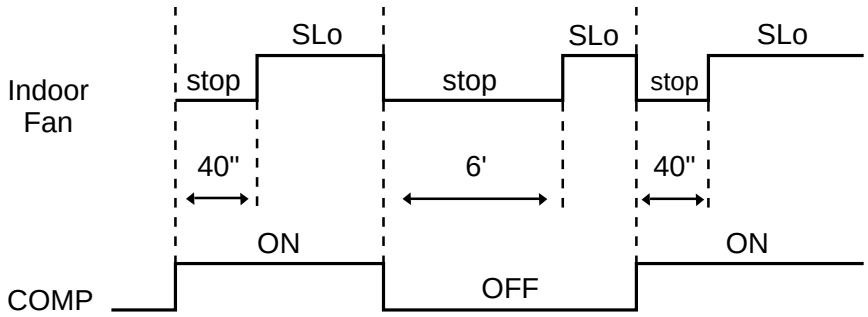
- Once the compressor stops, it will not start for 3 minutes during Cooling operation.

Anti-Freezing Control

- Same as Anti-Freezing Control for Cooling Mode operation. (For Soft Dry region, 6 minutes waiting is valid during compressor stops.)

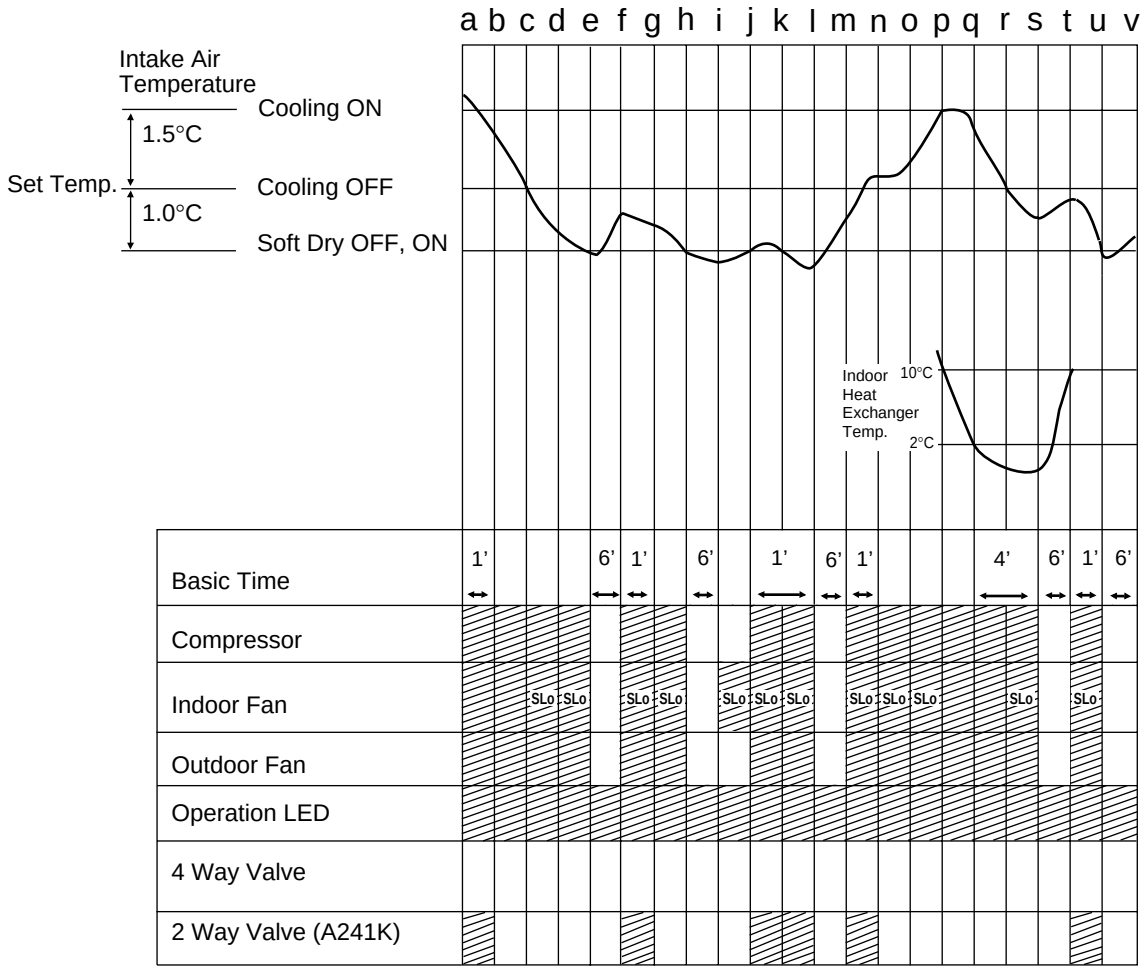
Automatic Fan Speed Mode

When Automatic Fan Speed is selected at Remote Control during Soft Dry Operation.
- Fan speed rotates at SLo speed.
- Deodorizing Control.



Operation Details

Soft Dry Operation Time Diagram



<Description of operation>

a – c, p~r : Cooling Operation
c – p, r~v : Soft Dry Operation
e – f : Soft Dry OFF
j – l : 60 sec. Forced Operation
q – t : Anti Freezing Control

Operation

Stop

Operation Details

3) Heating Mode Operation

- Heating in operation according to Remote Control setting.

Time Delay Safety Control

- When the compressor is stopped by Power Switch, Remote Control or there is a power failure, it restarts after 3 minutes when the Power Switch, Remote Control is turned ON or the power supply is resumed.
- When the setting temperature is reached during heating operation, the compressor stops and it will not start for 4 minutes.

Overload Protection Control

- If the temperature of the Outdoor Heat Exchanger less than -3°C, Outdoor Fan is ON. The Outdoor Fan stop, when Outdoor Heat Exchanger temperature is T_b or more according to Outdoor Air Temperature region as table below:

Outdoor Air Temperature	<10°C	⩾10°C ~ <15°C	⩾15°C ~ <20°C	⩾20°C ~ <25°C	⩾25°C	Outdoor Fan OFF
T_b	⩾5°C	⩾4°C	⩾3°C	⩾2°C	⩾1°C	

During starting of Heating mode and after deice, Outdoor Fan ON for 90 sec (Hi).

- If the indoor heat exchanger becomes 68°C or more, the compressor will stop and restart automatically. (Time Delay Safety Control - 4 minutes waiting)

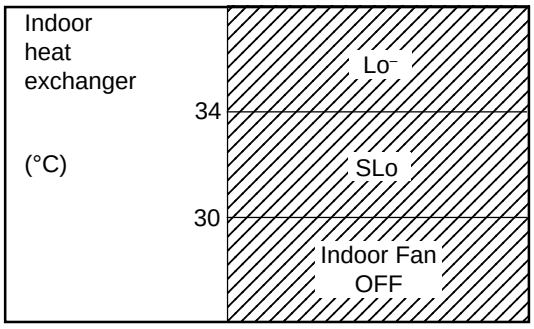
Indoor heat exchanger temperature ⩾ 68°C → Compressor OFF → Compressor restarts (4 minutes waiting)

4-way Valve Control

- 4-way valve ON during Heating operation, except deicing operation.
- When the unit is switched to "OFF" during Heating operation, 4-way valve stays at Heating position for 5 minutes.

Hot Start Control

When Heating operation starts, Indoor Fan will not start until the indoor heat exchanger reaches 30°C as diagram shown.



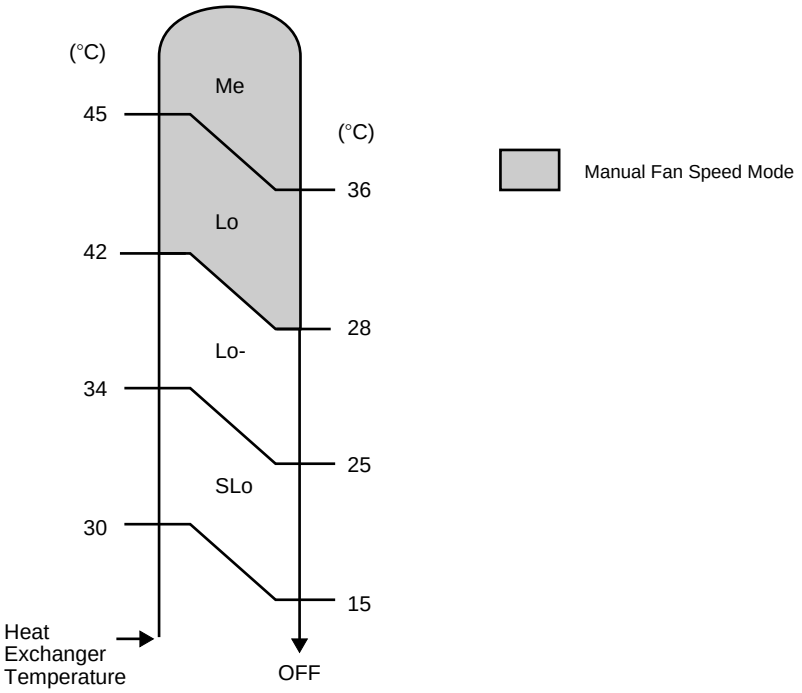
Hot Start is completed when indoor heat exchanger reaches 42°C.
Maximum Hot start duration = 4 minutes. After 4 minutes,
Hot start operation will be shifted to normal Heating operation.

Operation Details

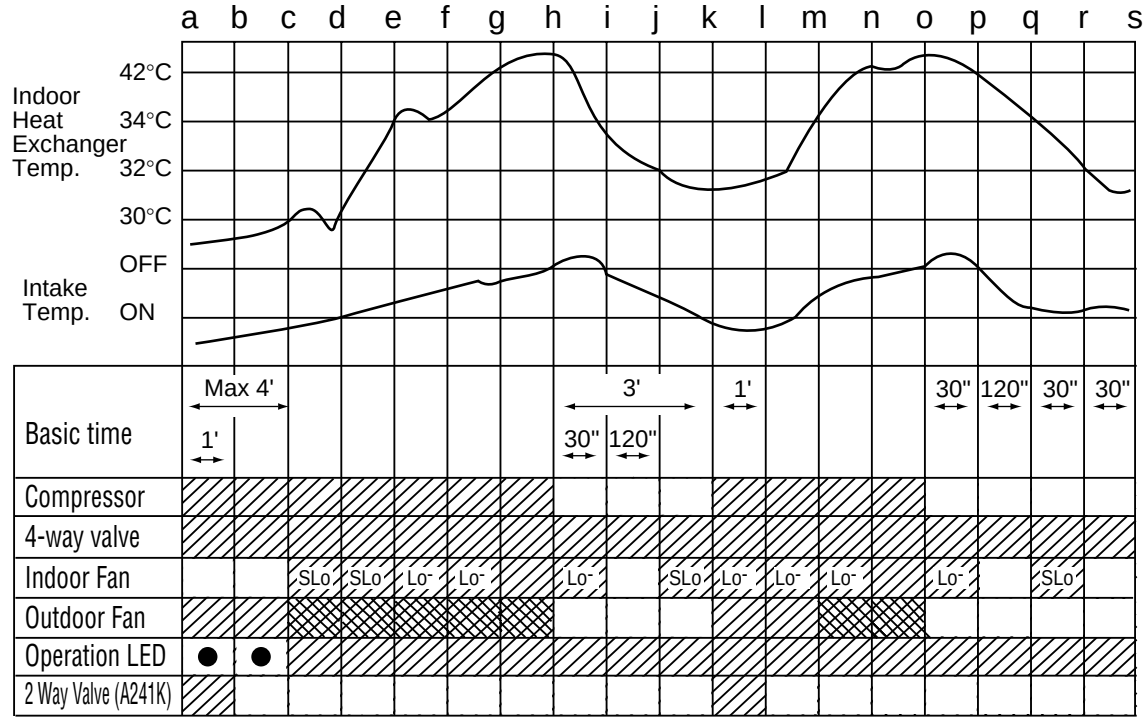
Automatic Fan Speed Mode

When Automatic Fan Speed is selected at Remote Control during heating operation.

- Fan speed rotates in the range of Me → SLo according to the heat exchanger temperature.



Heating Operation Time Diagram



<Description of operation>

a – c : Hot start (Indoor fan = OFF)
c – d : Hot start (Indoor fan = SLo)
h – k, o – s : Indoor fan control (controlled during thermostat OFF)

● : Blinking
Operation
Stop
Operation or Stop

Operation Details

Deicing Control

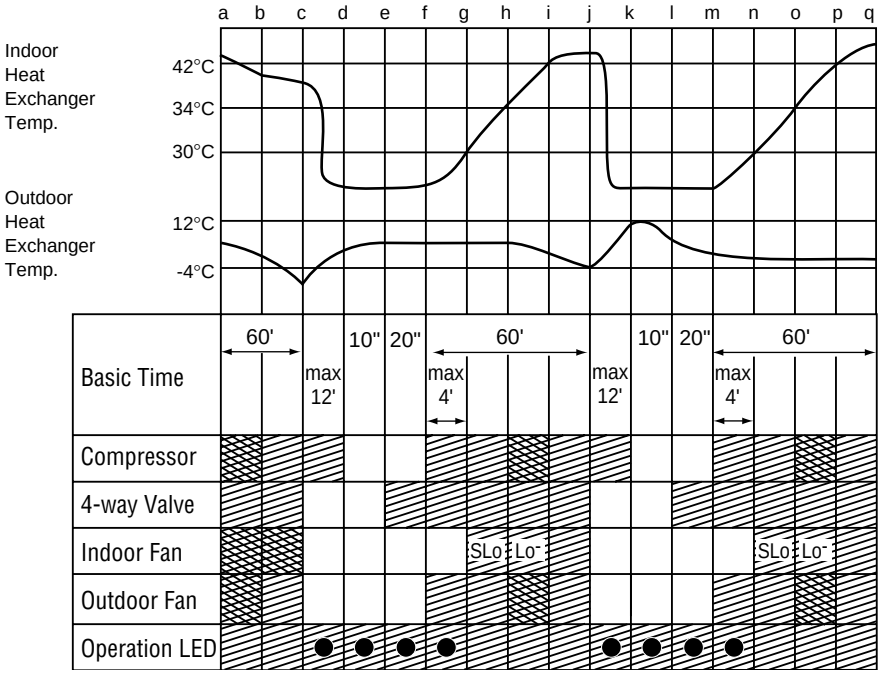
Deice starts to prevent frosting at outdoor heat exchanger.

- Normal Deicing
  Deice operation detection commences in Heating operation starts or 60 minutes after previous deice operation. If the outdoor piping temperature drops to –4°C or 50 sec. continuosly during compressor is in operation, deice will start.
  (There is no detection during Outdoor Fan stops.)

- Overload Deicing
  During heating operation, if the outdoor Fan OFF duration (due to overload control) is accumulated up to 60 minutes and after compressor starts for 1 minutes, deicing starts.

- Deicing ends when
  (a) 12 minutes after deicing operation starts;
  (b) The outdoor piping temperature rises to about 12°C.
- After deicing operation, compressor stops for 30 seconds and 4-way valve stays at cooling position for 10 seconds.

a) Normal Deicing Time Diagram



● : Blinking

Operation

Stop

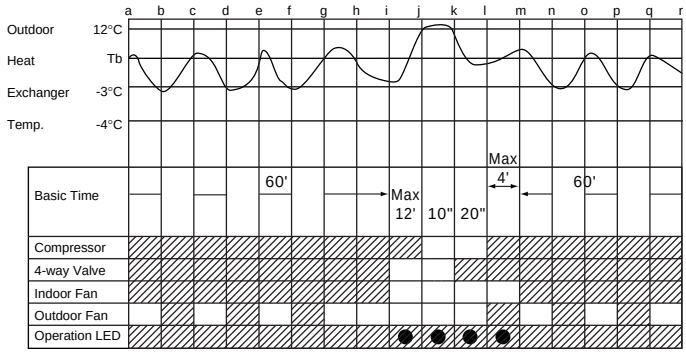
Operation or Stop

<Description of operation>

a – c	:	Deicing operation judging condition established.
c – f	:	Deicing operation.
f – g	:	Hot start (add 4 minute delay timing)

Operation Details

b) Overload Deicing Time Diagram



<Description of operation>

a – i	:	Overload control.
i – l	:	Overload deicing.
l – m	:	Hot start (add 4 min delay timing).
m – r	:	Overload control.

● : Blinking

Operation

Stop

4) Automatic Mode Operation

a) When the Automatic Mode Operation is selected, the indoor fan operates at SLo fan speed for 20 second to sense intake air temperature and determine the 1st operation mode.

Standard for Determining Operation Mode 1st Judgement

Intake Air Temperature ↑		
		Cooling
	23°C	Soft Dry
	20°C	Heating

※ Automatic Set Temperature Refer c) as below.

b) Operation mode will be determine again after 1hour of operation, if the room temperature reaches to set temperature and compressor off time is over 7 minutes 30 seconds continuously.

※ Indoor intake air is less than 16°C, Heating mode will immediate operate.

※ The present operation mode will be continued, if the room temperature does not reach to set temperature (Compressor keeps running) eventhough after 1 hour from automatic operation mode started.

– For 2nd judgement onwards, indoor fan will operate for 25 seconds to sense the intake air temperature for determining operation mode.

Standard for Determining Operation Mode 2nd Judgement onwards

Present Mode	Judgement		Next Mode		
			Cooling	Soft Dry	Heating
Cooling	23°C	Cooling	O (Judgement : 23°C & Above)	Not Applicable	O (Judgement : Below 23°C)
		Heating			
Soft Dry	20°C	Soft Dry	Not Applicable	O (Judgement : 20°C & Above)	O (Judgement : Below 20°C)
		Heating			
Heating	25°C	Cooling	O (Judgement : 25°C & Above)	Not Applicable	O (Judgement : Below 25°C)
		Heating			

※ Automatic Set Temperature Refer c) as below.

c) Automatic Set Temperature

For each operation, set temperature will automatically set as shown below.

However it can be selected 2°C higher or 2°C lower from standard set temperature by pressing the “Room Temperature Setting button”.

Operation Mode	Higher	Standard	Lower
	(+2°C)	(±0°C)	(–2°C)
Cooling	27°C	25°C	23°C
Soft Dry	24°C	22°C	20°C
Heating	23°C	21°C	19°C

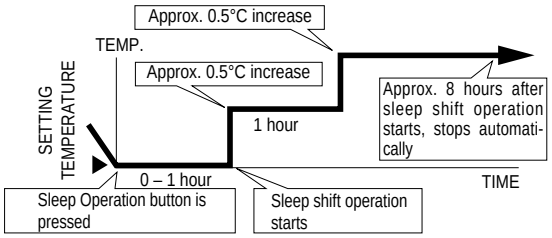
Operation Details

5) Sleep Mode Auto Operation

Cooling or Soft Dry Operation

When you press the SLEEP Mode, the following movement will start to avoid overcooling.

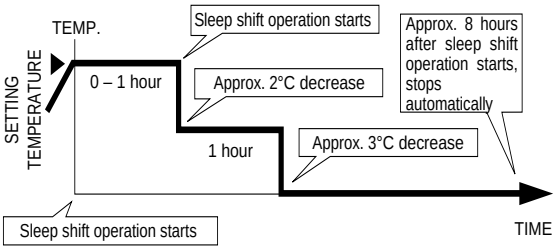
- The fan speed refer to Indoor Fan Motor Control.
- The setting temperature will be risen by **0.5**°C at the start of operation and by **0.5**°C one hour later.
- The operation will stop after **8** hours.
- When using together with the Timer, the ON-Timer has priority.



Heating Operation

When you press the SLEEP Mode, the following movement will start to avoid overheating.

- The fan speed refer to Indoor Fan Motor Control.
- The setting temperature will be risen by **2**°C at the start of operation and by **3**°C one hour later.
- The operation will stop after **8** hours.
- When using together with the Timer, the ON-Timer has priority.



6) Auto Restart Control

- If there is a power failure, operation will be automatically restarted when the power is resumed. It will start with previous operation mode and airflow direction. (Time Delay Safety Control is valid)
- Auto Restart Control is not available when Timer or Sleep Mode is set.
- This control can be omitted by cutting the jumper wire J2. (Refer Circuit Diagram)

7) Indoor Fan Speed Control

- Auto Fan Speed Control
  When set to Auto Fan Speed, the fan speed is adjusted between maximum and minimum setting as shown in the table.
- Manual Fan Speed Control
  Basic fan speed adjustment (3 settings, from Lo to Hi) can be carried out by using the Fan Speed selection button.

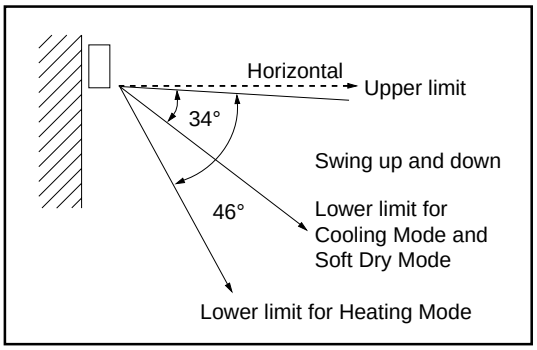
Fan Speed		High Speed ↔ Low Speed								
No.		8	7	6	5	4	3	2	1	0
Cooling	Manual		○	○	○					
	Auto		○	○			○			○
	Sleep					○				
Soft Dry	Manual, Auto						○			○
	Sleep					○				
Heating	Manual (A181K)	○		○	○					
	Manual (A241K)	○	○	○						
	Auto			○	○	○	○			○
	Sleep					○	○			○
Voltage to Fan Motor Drive Transistor (DCV)	CS-A181K	44.0	42.0	36.3	31.2	25.3	21.0	8.0	8.0	0
	CS-A241K	52.8	47.8	41.4	36.3	28.0	21.1	8.0	8.0	0
		SHi	Hi	Me	Lo	Lo⁻	SLo	START 2	START 1	STOP

Operation Details

8) Airflow Direction Control

Airflow Direction Auto-Control

- When set a Airflow Direction Auto-Control with remote control, the louver swings up and down as shown in the diagram.
- The louver does not swing when the Indoor Fan stops during operation.
- When stopped with remote control, the discharge vent is closed with the louver.



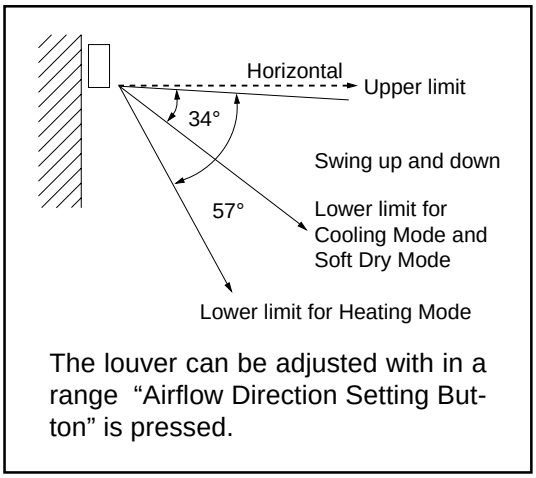
※ The left and right airflow direction louvers can be adjusted manually.

※ 1 There is no swinging while indoor fan is stopped during Cooling and Soft Dry operation.

※ 2 In Heating operation, when the indoor heat exchanger temperature rises to 38°C, the airflow direction is changed from upper limit to lower limit. When the indoor heat exchanger temperature falls to 35°C, the air flow direction is changed from lower limit to upper limit.

Airflow Direction Manual Control

- When the airflow direction set button is pressed, the automatic airflow is released and the airflow direction louver move up and down in the range shown in the diagram.
  The louver can be stopped by releasing the button at the desired louver position.
- When the remote control is used to stop the operation, the discharge vent is closed with airflow direction louver.



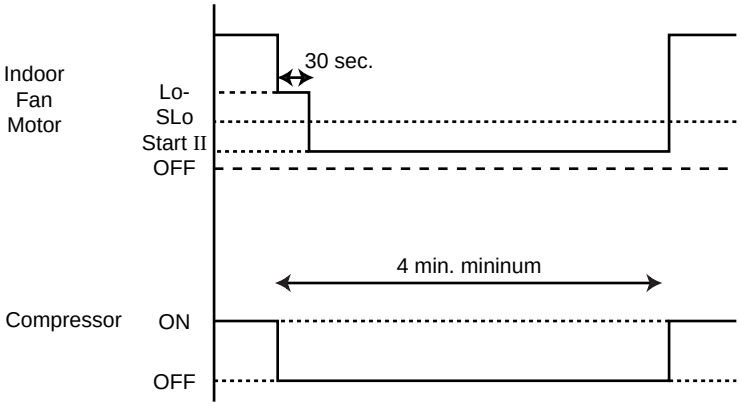
The louver can be adjusted with in a range "Airflow Direction Setting Button" is pressed.

※ The left and right airflow direction louvers can be adjusted manually.

9) Delay ON Timer Control

- When the Delayed ON Timer is set by using the remote control, the unit will start operate slightly before the set time, so that the room will reach nearly to the set temperature by the desired time.
- For Cooling and Soft Dry mode, the operation will start, 15 minutes before the set time.
- For Heating mode, the operation will start 30 minutes before the set time.
- For Automatic mode, the indoor fan will operate at SLo speed for 20 seconds, 30 minutes before the set time to detect the intake air temperature to determine the operation mode. The operation indication lamp will blink at this time.

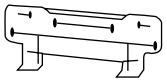
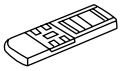
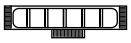
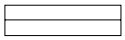
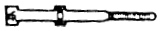
10) Cold Draught Control



- When COMP = Thermal OFF, indoor fan speed immediately changed to Lo⁻ for 30 sec., follow by Start II speed until COMP = ON.

Installation Information

Attached accessories

No.	Accessories part	Qty.	No.	Accessories part	Qty.
1	Installation plate 	1	6	Remote control 	1
2	Installation plate fixing screw	6	7	Battery	2
3	Vinyl tape	3	8	Air purifiying filter 	2
4	Vinyl tape 	1	9	Drain elbow	1
5	Band 	2			

Accessories: Flaring piping kit
CZ-4F5, 7, 10AN (A181K)
CZ-52F5, 7, 10AN (A241K)

SELECT THE BEST LOCATION

INDOOR UNIT

- There should not be any heat source or steam near the unit.
- There should not be any obstacles blocking the air circulation.
- A place where air circulation in the room is good.
- A place where drainage can be easily done.
- A place where noise prevention is taken into consideration.
- Do not install the unit near the door way.
- Ensure the spaces indicated by arrows from the wall, ceiling, fence or other obstacles.
- Indoor unit of this room air conditioner shall be installed on the wall in a height of at least 2.3 m.

OUTDOOR UNIT

- If an awning is built over the unit to prevent direct sunlight or rain, be careful that heat radiation from the condenser is not obstructed.
- There should not be any animal or plant which could be affected by hot air discharged.
- Keep the spaces indicated by arrows from wall, ceiling, fence or other obstacles.
- Do not place any obstacles which may cause a short circuit of the discharged air.
- If piping length is over 10m, additional refrigerant should be added as shown in the table.

Piping length and the elevation.

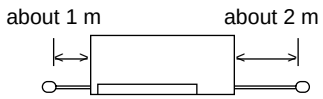
MODEL	Piping size		Max. Piping Length A (m)	Max. Elevation B (m)	Rated		Additional Refrigerant (g/m)
	Gas	Liquid			Length (m)	Elevation (m)	
A181K	1/2"	1/4"	25	20	7.5	5	20
A241K	5/8"	1/4"	25	20	7.5	5	30

If the unit will be installed at a 12m distance, the quantity of additional refrigerant should be 60g…(12–10)m × 30g/m = 60g (Example : A241K)

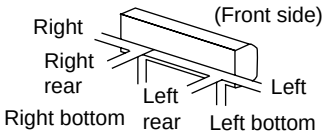
Installation Information

Indoor / Outdoor unit installation diagram

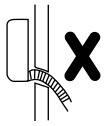
Length of power supply cord



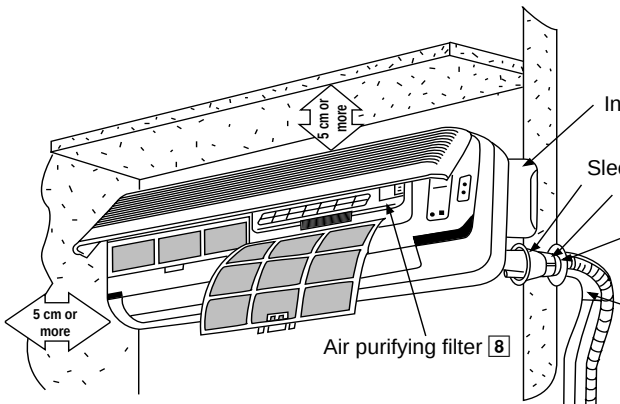
Piping direction



Attention not to bend up drain hose



Installation parts you must purchase (※)



(Left and right are identical)

Installation plate 1

Sleeve (※)

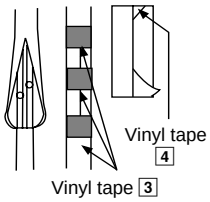
Bushing-Sleeve (※)

Putty (Gum Type Sealer) (※)

Bend the pipe as closely on the wall as possible, but be careful that it doesn't break.

Insulation of piping connection

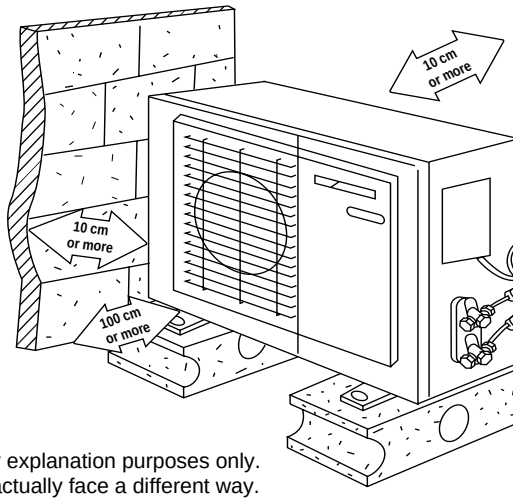
- Carry out insallation after checking for gas leaks.
- After securing with three of the vinyl tape 3, wrap with vinyl tape 4.



Vinyl tape (Wide) (※)

- Apply after carrying out a drainage test.
- To carry out the drainage test, remove the air filters and pour water into the heat exchanger.

Saddle (※)



Connecting cable (3-CORE WIRE/2.5 mm^2) Locally approved cable.

Additional drain hose (※)

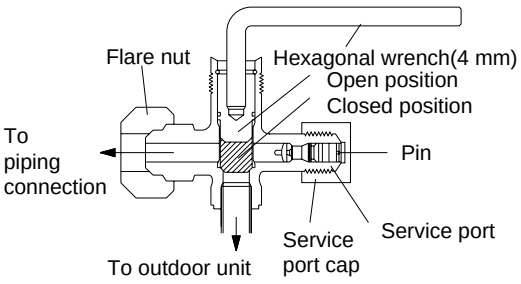
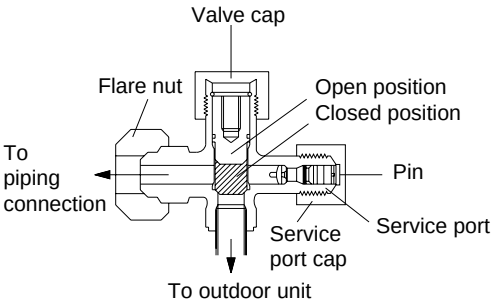
1/4" Liquid side piping (※)

Gas side piping 1/2" or 5/8" (※)

Vinyl tape (※) (Narrow)

- This illustration is for explanation purposes only. The indoor unit will actually face a different way.

3-way Valve

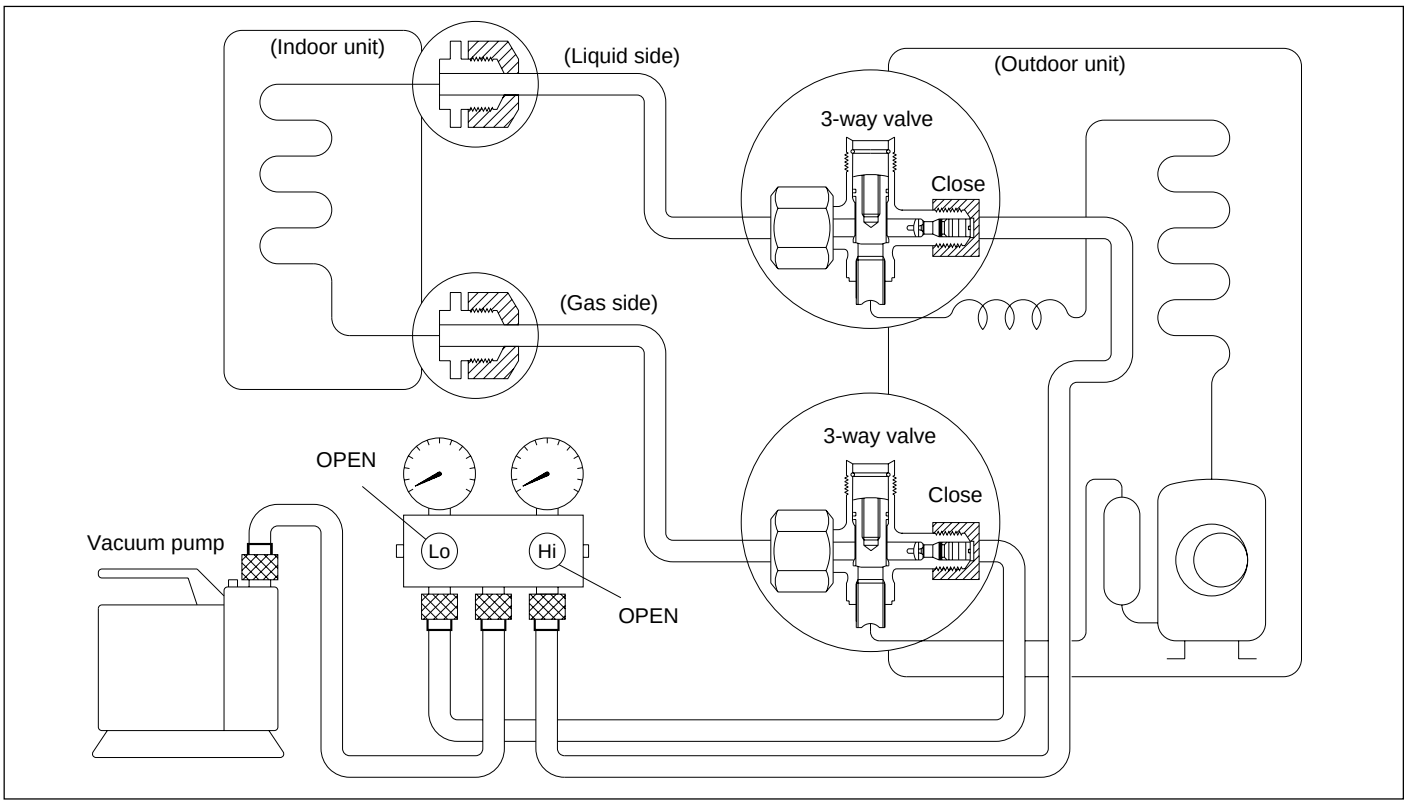
	3-way Valve (Liquid Side)		3-way Valve (Gas Side)	
				
Works	Shaft Position	Service Port	Shaft Position	Service Port
Shipping	Closed (With valve cap)	Closed (With cap)	Closed (With valve cap)	Closed (With cap)
Evacuation (Installation and Re-installation)	Closed (Clockwise)	Open (Connected manifold gauge w/charging cylinder)	Closed (Clockwise)	Open (Push-pin)
Operation	Open (With valve cap)	Closed (With cap)	Open (With valve cap)	Closed (With cap)
Pumping down (Transferring)	Closed (Clockwise)	Closed (With cap)	Open (Counter-clockwise)	Open (Connected manifold gauge)
Evacuation (Servicing)	Open (Counter-clockwise)	Open (Connected manifold gauge)	Open (Counter-clockwise)	Open (Connected manifold gauge)
Gas charging (Servicing)	Open (Counter-clockwise)	Open (Connected manifold gauge)	Open (Counter-clockwise)	Open (Connected manifold gauge)
Pressure check (Servicing)	Open (Counter-clockwise)	Open (Connected manifold gauge)	Open (Counter-clockwise)	Open (Connected manifold gauge)
Gas releasing (Servicing)	Open (Counter-clockwise)	Open (Connected manifold gauge)	Open (Counter-clockwise)	Open (Connected manifold gauge)

1 Evacuation of Installation

When installing an air conditioner, be sure to evacuate the air inside the indoor unit and pipes in the following procedure.

Required tools: hexagonal wrench, adjustable wrench, torque wrenches, wrench to hold the joints, gas leak detector, and charging set.

The air in the indoor unit and in the piping must be purged. If air remains in the refrigeration pipings, it will affect the compressor, reduce the cooling capacity, and could lead to a malfunction.



Service port cap
Be sure, using a torque wrench to tighten the service port cap (after using the service port), so that it prevents the gas leakage from the refrigeration cycle.

Procedure:

(1) Connect a charging hose with a push pin to the Low and High sides of a charging set and the service ports of a 3-way valves.
- Be sure to connect the end of the charging hose with the push pin to the service port.

(2) Connect the centre hose of the charging set to a vacuum pump.

(3) Turn on the power switch of the vacuum pump and make sure that the needle in the gauge moves from 0 cmHg (0 MPa) to –76 cmHg (–0.1 MPa). Then evacuate the air for approximately 10 minutes.

(4) Close the valve of both the Low and High sides of the charging set and turn off the vacuum pump. Make sure that the needle in the gauge does not move after approximately 5 minutes.
BE SURE TO TAKE THIS PROCEDURE IN ORDER TO AVOID REFRIGERANT GAS LEAKAGE.

(5) Disconnect the charging hose from the vacuum pump and from the service ports of the 3-way valves.

(6) Tighten the service port caps of both the 3-way valves at a torque of 18 N•m with a torque wrench.

(7) Remove the valve caps of both the 3-way valves. Position both of the valves to "open" using a hexagonal wrench (4 mm).

(8) Mount valve caps onto both of the 3-way valves.
- Be sure to check for gas leakage.

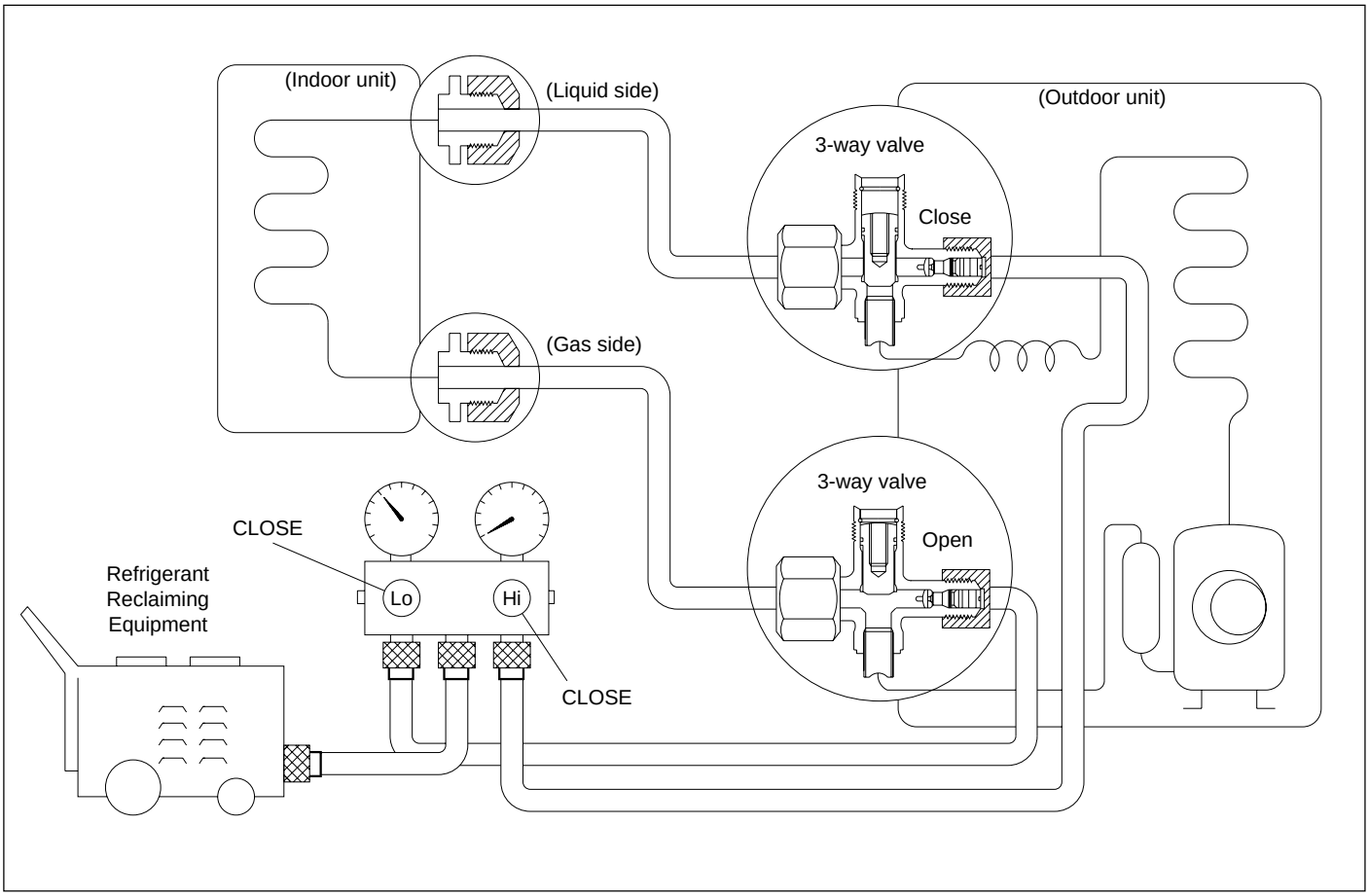
Caution

If gauge needle does not move from 0 cmHg (0 MPa) to –76 cmHg (–0.1 MPa) in step (3) above, take the following measures:

If the leaks stop when the piping connections are tightened further, continue working from step (3).

If the leaks do not stop when the connections are retightened, repair the location of the leak.

2 Pumping down



Procedure:

(1) Confirm that both the 3-way valves are set to the open position.
- Remove the valve stem caps and confirm that the valve stems are in the open position.
- Be sure to use a hexagonal wrench to operate the valve stems.

(2) Operate the unit for 10 to 15 minutes.

(3) Stop operation and wait for 3 minutes, then connect the charge set to the service port of the 3-way valve.
- Connect the charge hose with the push pin to the Gas side service port.

(4) Air purging of the charge hose.
- Open the low-pressure valve on the charge set slightly to purge air from the charge hose.

(5) Set the Liquid side 3-way valve to the close position.

(6) Operate the air conditioner at the cooling cycle and stop it when the gauge indicates 0 kg/cm²G (0 MPa).
- If the unit cannot be operated at the cool condition (weather is rather cool), press the Pump Down Switch on the Indoor unit.
- So that the unit can be operated.

(7) Immediately set the gas side 3-way valve to the close position.
- Do this quickly so that the gauge ends up indicating 1 to 3 kg/cm²G (0.1 MPa to 0.3 MPa).

(8) Use refrigerant reclaiming equipment to collect refrigerant from indoor unit and pipes.

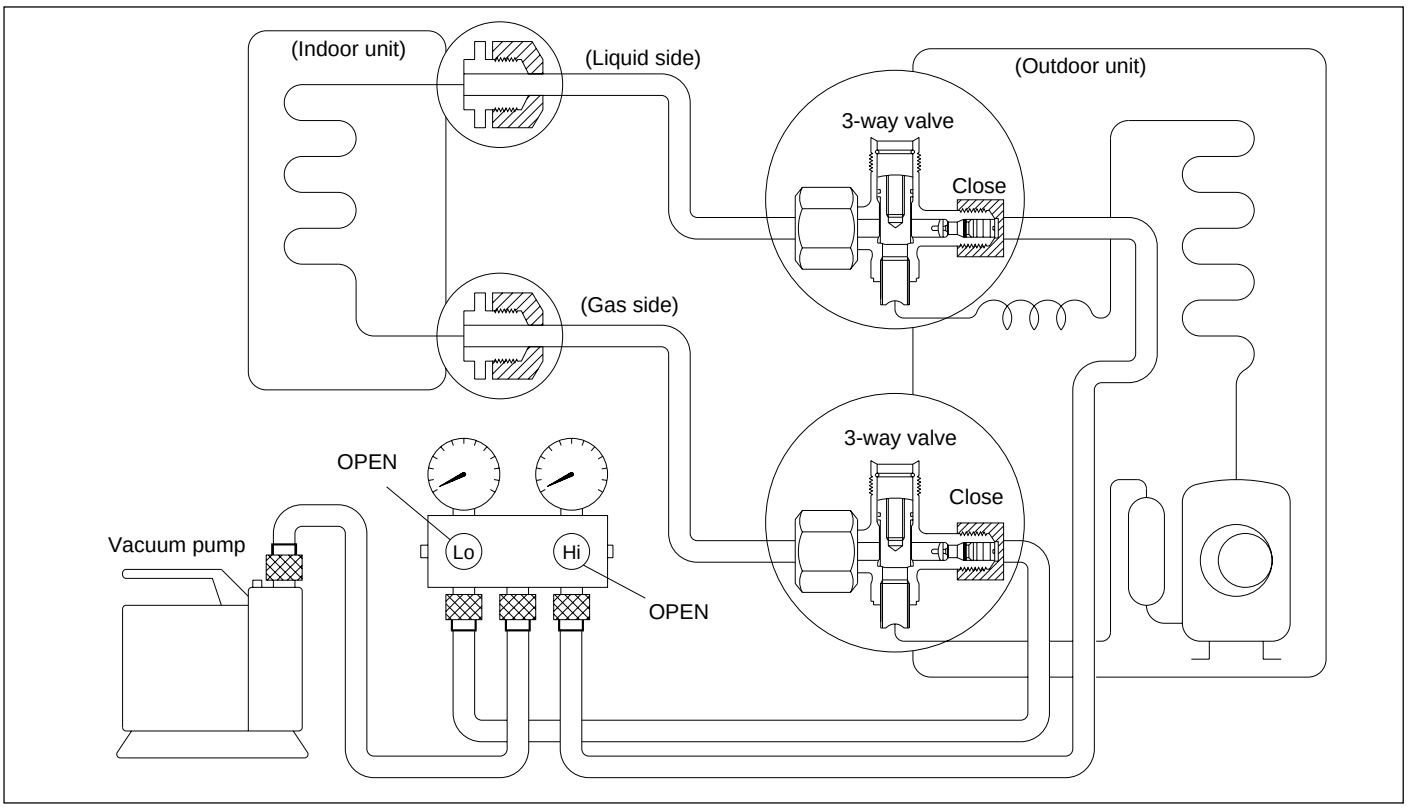
(9) Disconnect the charge set, and mount both the 3-way valve's stem nuts and the service port caps.
- Use a torque wrench to tighten the service port cap to a torque of 18 N•m.
- Be sure to check for gas leakage.

(10) Disconnect pipes from indoor unit and outdoor unit.

3 Evacuation of Re-installation

WHEN RE-INSTALLING AN AIR CONDITIONER, BE SURE TO EVACUATE THE AIR INSIDE THE INDOOR UNIT AND PIPES in the following procedure.

If air remains in the indoor unit and refrigeration pipes, it will affect the compressor, reduce to cooling capacity, and could lead to a malfunction.



Procedure:

(1) Connect a charging hose with a push pin to the Low and High sides of a charging set and the service port of the 3-way valve.
- Be sure to connect the end of the charging hose with the push pin to the service port.

(2) Connect the centre hose of the charging set to a vacuum pump.

(3) Turn on the power switch of the vacuum pump and make sure that the needle in the gauge moves from 0 cmHg (0 MPa) to –76 cmHg (–0.1 MPa). Then evacuate the air for approximately 10 minutes.

(4) Close the valve of both Low side and High side of the charging set and turn off the vacuum pump. Make sure that the needle in the gauge does not move after approximately 5 minutes.
BE SURE TO TAKE THIS PROCEDURE IN ORDER TO AVOID REFRIGERANT GAS LEAKAGE.

(5) Disconnect the charging hose from the vacuum pump.

(6) Charge the pipes and indoor unit with gas refrigerant from liquid (High) side 3-way valve service port and then discharge the refrigerant until gas (Low) side gauge needle indicates 3 kg/cm² (0.3 MPa).
- **BE SURE TO USE REFRIGERANT RECLAIMING EQUIPMENT WHILE DISCHARGING THE REFRIGERANT.**
- Purge the air from charge set's centre hose.
- Be sure to check for gas leakage.

Caution

If gauge needle does not move from 0 cmHg (0 MPa) to –76 cmHg (–0.1 MPa) in step (3) above, take the following measures:

If the leaks stop when the piping connections are tightened further, continue working from step (3).

If the leaks do not stop when the connections are retightened, repair the location of the leak.

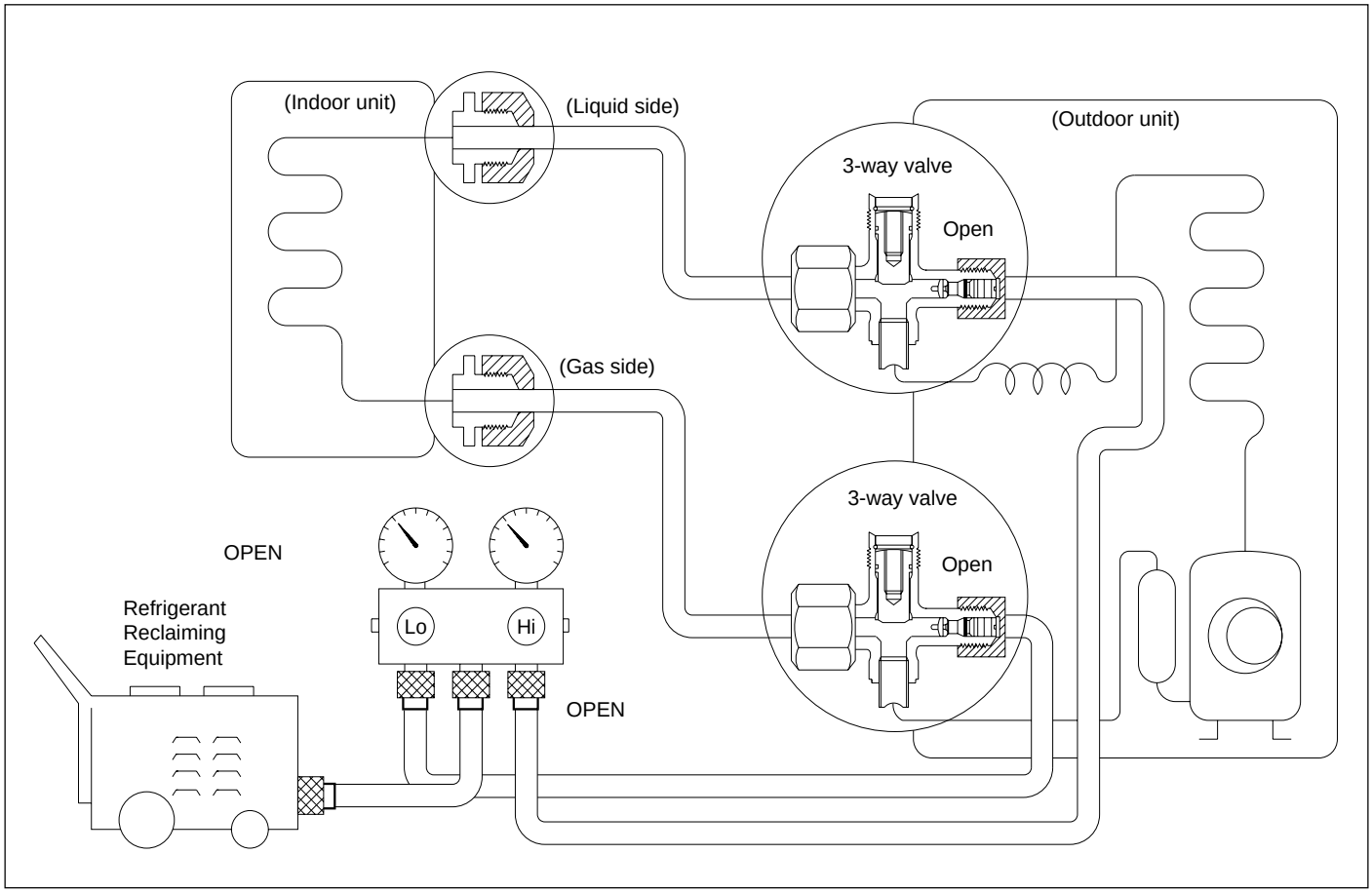
(7) Tighten the service port caps of both the 3-way valves at a torque of 18 N•m with a torque wrench.

(8) Remove the valve caps of both the 3-way valves. Position both of the valves to "open" using a hexagonal wrench (4 mm).

(9) Mount valve caps onto the 3-way valves.

4 Balance refrigerant of the 3-way valves

(Lack of refrigerant in the refrigeration cycle)



Procedure:

(1) Confirm that both the 3-way valves are set to the opened position.

(2) Connect the charge set to the 3-way valve's service port.
- Leave the valve on the charge set closed.
- Connect the charge hose with the push-pin to the service port.
- Confirm whether the pressure indicates more than 0.1 MPa (1 kg/cm^{2}G).

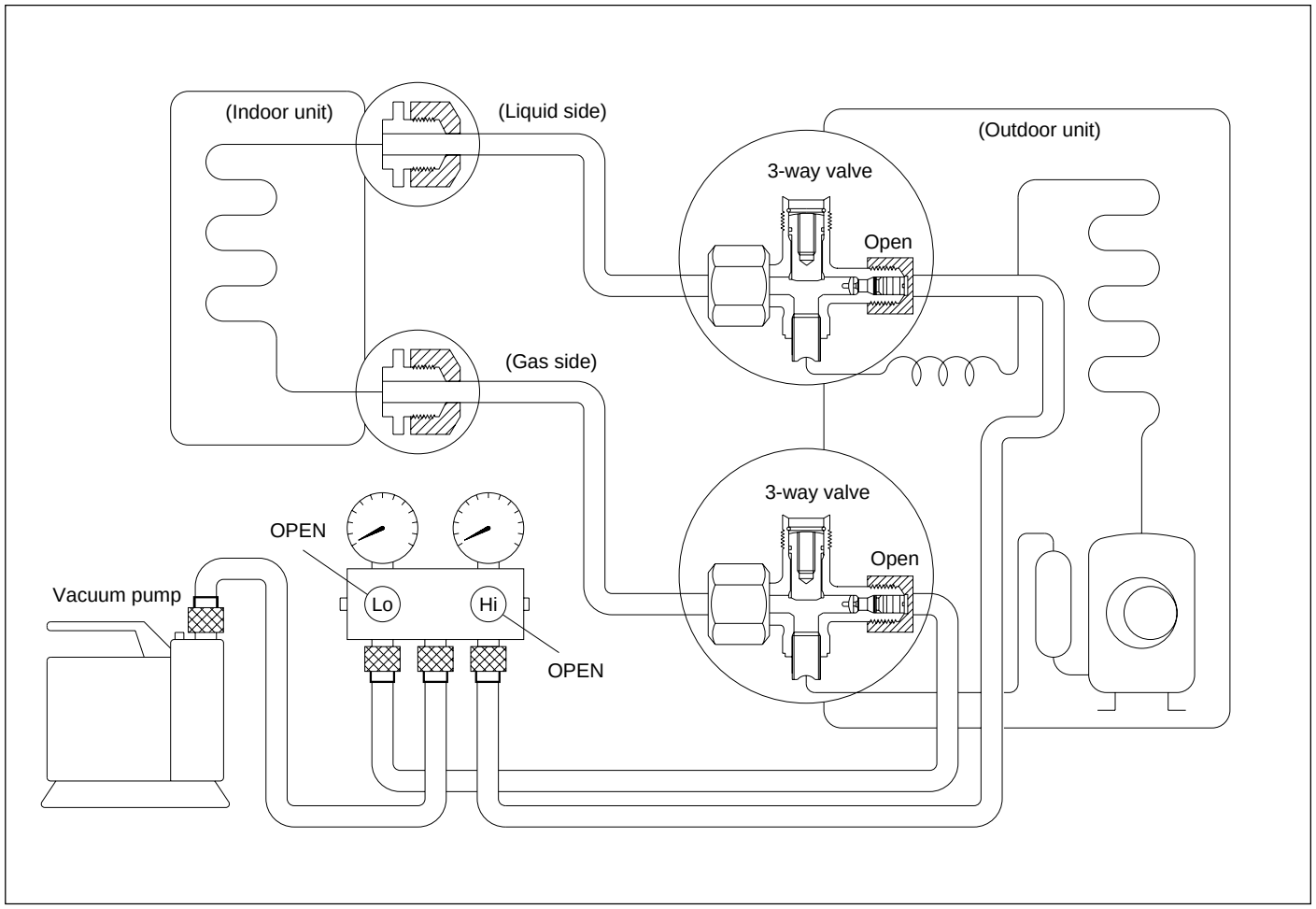
(3) Connect the charge set's centre hose to refrigerant reclaiming equipment.

(4) Open the valve (Low side) on the charge set and loosen the hose connected with the Refrigerant Reclaiming Equipment to purge the air from the hose.

(5) Turn on refrigerant reclaiming equipment to collect the refrigerant until the needle indicates 0 (no refrigerant is remaining).

5 Evacuation

(No refrigerant in the refrigeration cycle)



Procedure:

(1) Connect the vacuum pump to the charge set's centre hose.

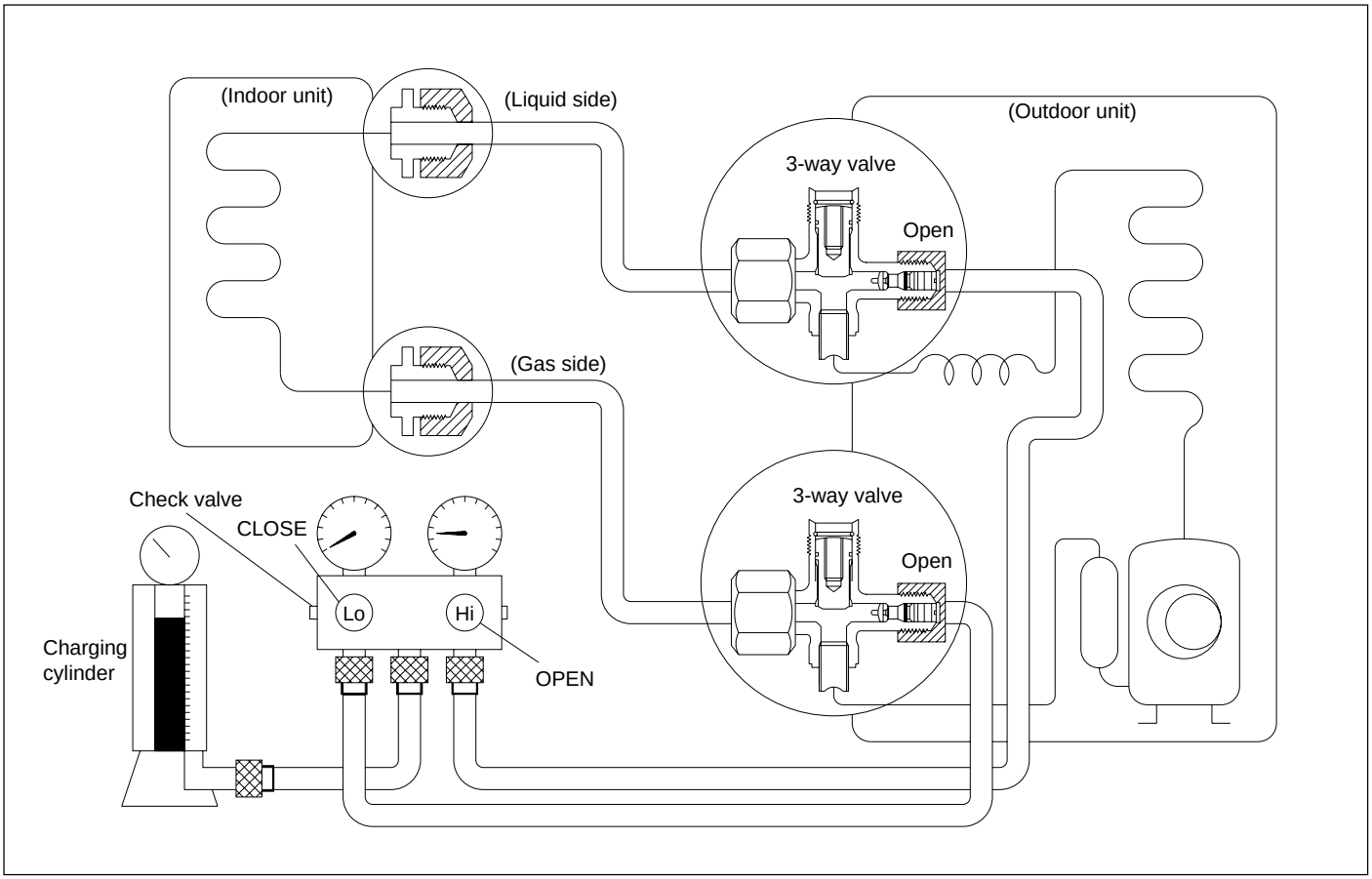
(2) Turn on the vaccuum pump to evacuate the unit.
- Confirm that the gauge needle has moved toward –76 cmHg (–0.1 MPa).
- Apply the vacuum for approximately 1 hour (vaccuum of 4 mmHg or less).

(3) Close the valves (Low side and High side) on the charge set, turn off the vacuum pump, and confirm that the gauge needle does not move (approximately 5 minutes after the vacuum pump is turned off).

(4) Disconnect the charge hose from the vacuum pump.

6 Gas charging

(After Evacuation)



Procedure:

(1) Connect the charge hose to the charging cylinder.
- Connect the charge hose which was disconnected from the vacuum pump to the valve at the bottom of the cylinder.

(2) Purge the air from the charge hose.
- Open the valve at the bottom of the cylinder and use a screwdriver to press the check valve on the charge set to purge the air (be careful of the liquid refrigerant).

(3) Open the High side on the charge set and charge the refrigerant to the unit.
- Be sure to open only the High side valve on the charge set to charge the system from the liquid-side (high-presure) pipe. (If the system cannot be charged with the specified amount of refrigerant, operate the compressor until the specified amount can be charged, and then close the valve at the bottom of the charge cylinder.)

(4) Immediately disconnect the charge hoses from both 3-way valve service ports.

(5) Mount the valve stem nuts and the service port caps onto the 3-way valves.
- Use torque wrench to tighten the service port caps to a torque of 18 N•m.
- Be sure to check for gas leakage.

Servicing Information

(A) Disassembly of the parts (Indoor Unit)

- **Inspection points for the Indoor Electronic Controller**

1. The Electronic Controller, a signal Receiver and an Indicator can be seen by removing the Front Grille and Control Board Cover, as shown in the Fig. 1.

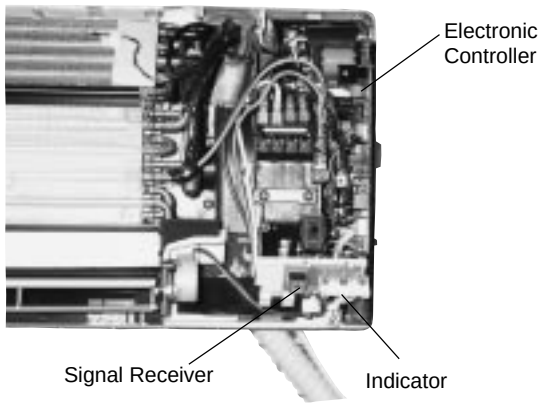


Fig. 1

- **Indoor Fan Motor removal procedure**

1. Remove the connector CN-MTR (GREEN) of Fan Motor and connector CN-STM (GREEN) of stepping motor from the electronic controller. Release the earth wire (YELLOW-GREEN) from the control board terminal and sensors from its holders. (Refer Fig. 2.)

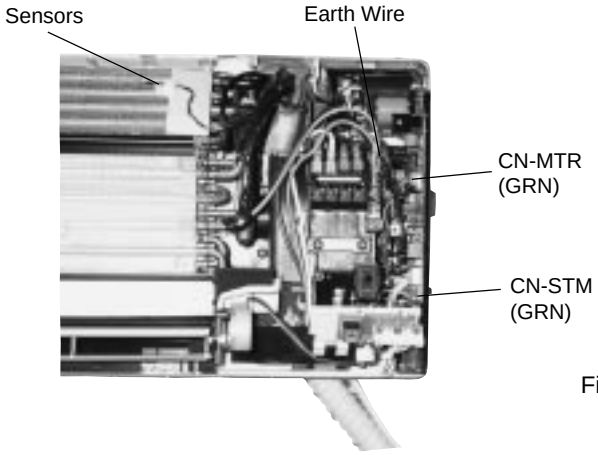


Fig. 2

2. Remove the Control Board.
   As shown in Fig. 3, remove the 3 screws and release the tab at the top of Control Board. Pull the Control Board forward slightly.

Caution: Removal of Discharge Grille before removing the control board is necessary to avoid damaging other parts.

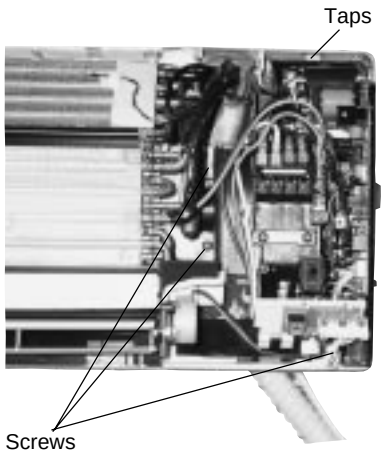


Fig. 3

Servicing Information

3. Remove the Discharge Grille.
   Remove the Discharge Grille and then pull the Discharge Grille in a down and forward direction.

Fig. 4

4. Remove the Indoor Fan Motor
   Loosen the Fan Mounting Screw at the junction with Cross Flow Fan.

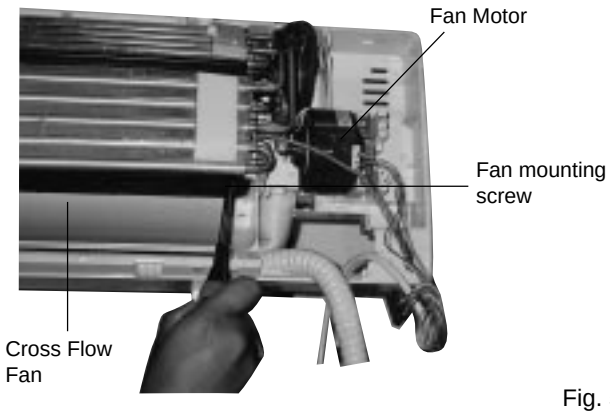


Fig. 5

Remove the screw that hold the metal plate and remove the metal plate.

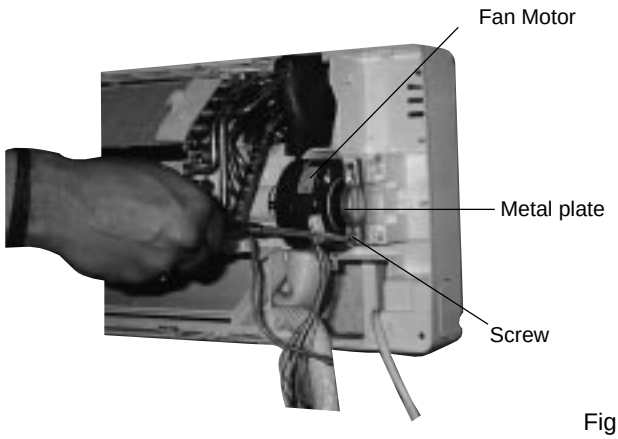


Fig. 6

Pull off the Bearing at the left of the Cross Flow Fan and remove the Indoor Fan motor.

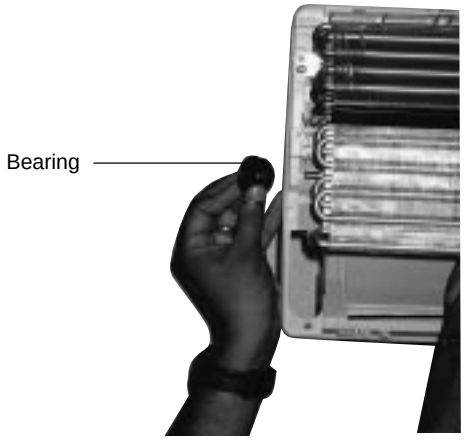


Fig. 7

Servicing Information

- **Cross Flow Fan Removal Procedure**

1. Remove the Fan Mounting Screws and Bearing. (Refer to No. 4 of Indoor Fan Motor the removal procedure)

2. Loosen the 2 screws mounted at the left side of the evaporator.

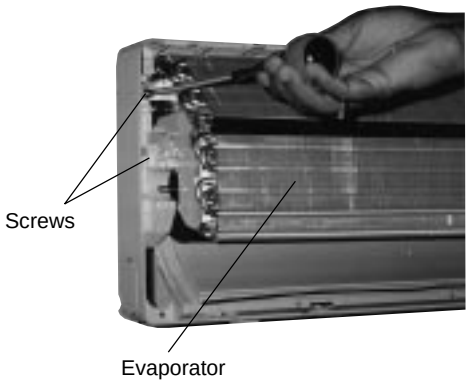


Fig. 8

3. Pull the left side of the evaporator forward slightly and remove the cross Flow Fan.

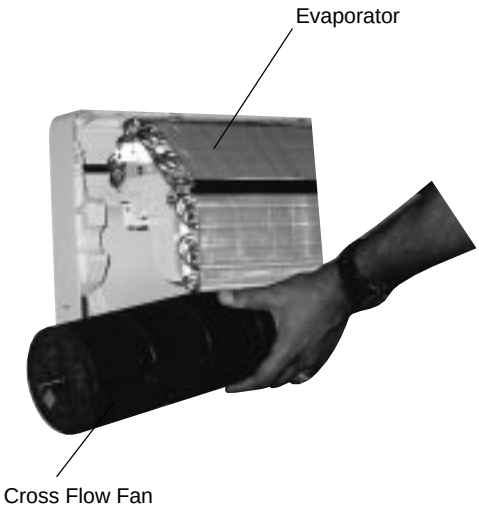


Fig. 9

(B) Disassembly of the parts (Outdoor Unit)

- **Inspection points for the Outdoor Electronic Controller**

1. The Electronic Controller, Can be seen by removing the cabinet Top plate and Front plate, as shown in the Fig. 10

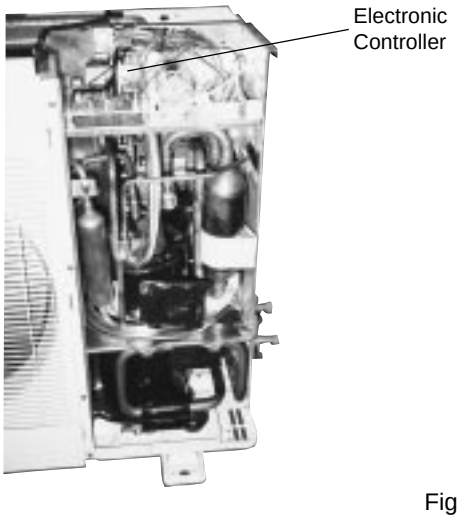


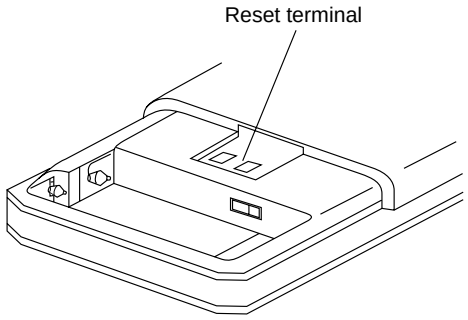
Fig. 10

Servicing Information

(C) Remote Control Transmission Setting

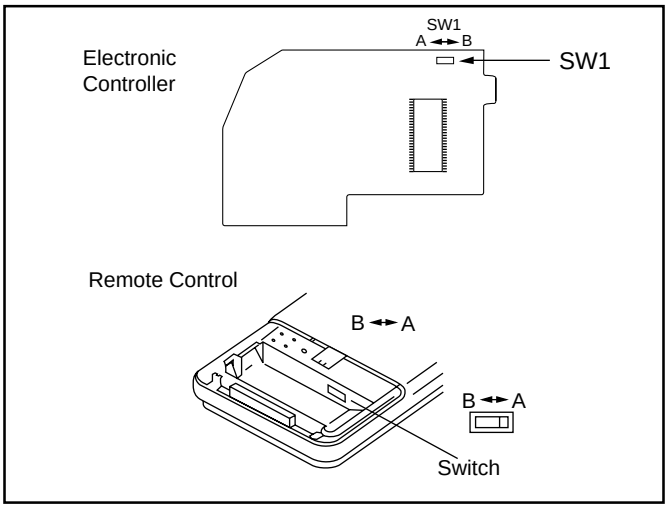
- **Remote Control Reset**

When the batteries are inserted for the first time, or the batteries are replaced, all the indications will blink and the remote control might not work.
If this happens, remove the back cover of the remote control and you will find a resetting terminal, and by shorting it with a minus screwdriver, it will return to normal.



- **Changing the wireless remote control transmission code**

When two indoor units are installed in the same room, in order to prevent operating errors caused by using two remote controls, set up the remote control [B ↔ A] switch (SW1).
The unit is set to A when it is shipped.



- **By adding a jumper wire to the remote control side and a carbon resistor (1/4 W, 10 kΩ) to the indoor printed circuit board, it is possible to select from 4 types of transmission codes including the condition at time of delivery condition (1).**

	Remote control		Indoor printed circuit board		Note
	Switch SW B ↔ A	J – B	Switch SW1	RX	
1	A	———	A	———	At product delivery
2	B	———	B	———	
3	A	Jumper wire	A	10kΩ	
4	B	Jumper wire	B	10kΩ	

Troubleshooting Guide

Refrigeration cycle system

In order to diagnose malfunctions, make sure that there are no electrical problems before inspecting the refrigeration cycle. Such problems include insufficient insulation, problem with the power source, malfunction of a compressor and a fan.
The normal outlet air temperature and pressure of the refrigeration cycle depends on various conditions, the standard values for them are shown in the table to the right.

Normal Pressure and Outlet Air Temperature (Standard)

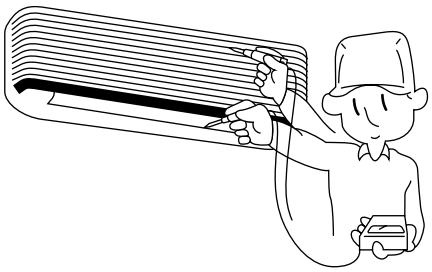
	Gas pressure MPa (kg/cm^2G)	Outlet air temperature (°C)
Cooling mode	0.4 ~ 0.6 (4 ~ 6)	12 ~ 16
Heating Mode	1.5 ~ 2.1 (15 ~ 21)	36 ~ 45

★ Condition: Indoor fan speed; High
Outdoor temperature 35°C at the cooling mode and 7°C at the heating mode

Difference in the intake and outlet air temperatures

- More than 8°C (15 minutes after an operation is started.) at the cooling mode / More than 14°C (15 minutes after an operation is started.) at the heating mode → **Normal**
- Less than 8°C at the cooling mode / Less than 14°C at the heating mode

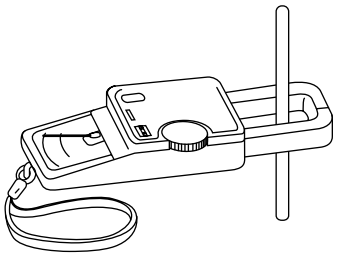
- **Measuring the air temperature difference**



Value of electric current during operation

- Higher than specified → Dusty condenser preventing heat radiation
- Higher than specified → Excessive amount of refrigerant
- Lower than specified

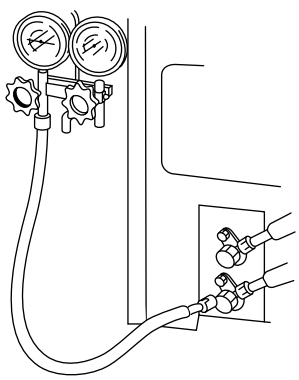
- **Measuring electric current during operation**



Gas side pressure

- Cooling Mode, High → Inefficient compressor
- Cooling Mode, Low → Insufficient refrigerant
- Cooling Mode, Low → Clogged strainer or capillary tube
- Heating Mode, Low → Inefficient compressor
- Heating Mode, Low → Insufficient refrigerant
- Heating Mode, Low → Clogged strainer or capillary tube

- **Measuring gas side pressure**



Troubleshooting Guide

1. Relationship between the condition of the air conditioner and pressure and electric current

Condition of the air conditioner	Cooling Mode			Heating Mode		
	Low Pressure	High Pressure	Electric current during operation	Low Pressure	High Pressure	Electric current during operation
Insufficient refrigerant (gas leakage)	↘	↘	↘	↘	↘	↘
Clogged capillary tube or Strainer	↘	↘	↘	↘	↘	↘
Short circuit in the indoor unit	↘	↘	↘	↗	↗	↗
Heat radiation deficiency of the outdoor unit	↗	↗	↗	↘	↘	↘
Inefficient compression	↗	↘	↘	↗	↘	↘

- Carry out the measurements of pressure, electric current, and temperature fifteen minutes after an operation is started.

2. Diagnosis methods of a malfunction of a compressor and a 4-way valve

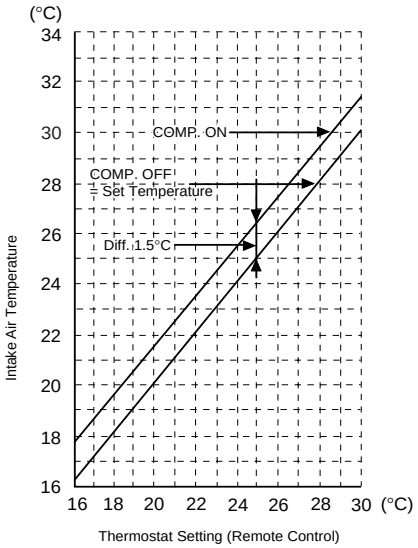
Nature of fault	Symptom
Insufficient compressing of a compressor	• Electric current during operation becomes approximately 20% lower than the normal value. • The discharge tube of the compressor becomes abnormally hot (normally 70 to 90°C). • The difference between high pressure and low pressure becomes almost zero.
Locked compressor	• Electric current reaches a high level abnormally, and the value exceeds the limit of an ammeter. In some cases, a breaker turns off. • The compressor is a humming sound.
Inefficient switches of the 4-way valve	• Electric current during operation becomes approximately 80% lower than the normal value. • The temperature difference between from the discharge tube to the 4-way valve and from suction tube to the 4-way valve becomes almost zero.

Technical Data

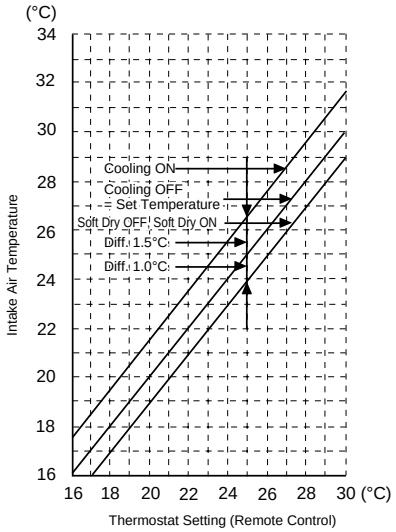
■ Thermostat characteristics

CS-A181K / CS-A241K

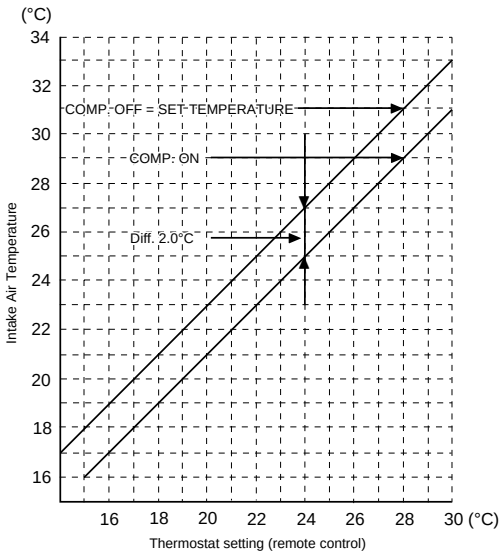
- **Cooling**



- **Soft Dry**



- **Heating**



■ Sensible Capacity Chart

- **CS-A181K**

Cooling	Outdoor Temp.(°C)											
Indoor Wet Bulb Temp.	30			35			40			46		
	TC	**SHC**	**IP**	**TC**	**SHC**	**IP**	**TC**	**SHC**	**IP**	**TC**	**SHC**	**IP**
17.0°C	5.10	4.63	2.01	4.78	4.47	2.17	4.47	4.16	2.32	4.06	3.59	2.50
19.0°C				5.20		2.19						
19.5°C	5.67	4.06	2.04	5.30	3.80	2.19	4.94	3.74	2.34	4.52	3.59	2.52
22.0°C	6.29	3.80	2.06	5.88	3.33	2.21	5.46	2.96	2.39	4.99	2.60	2.56

Heating	Outdoor Temp.(°C)											
Indoor Wet Bulb Temp.	30			35			40			46		
	TC	**SHC**	**IP**	**TC**	**SHC**	**IP**	**TC**	**SHC**	**IP**	**TC**	**SHC**	**IP**
17.0°C	6.08	5.52	2.10	5.70	5.33	2.26	5.33	4.96	2.42	4.84	4.28	2.60
19.0°C				6.20		2.28						
19.5°C	6.76	4.84	2.12	6.32	4.53	2.28	5.89	4.46	2.44	5.39	4.28	2.62
22.0°C	7.50	4.53	2.14	7.01	3.97	2.30	6.51	3.53	2.49	5.95	3.10	2.67

- **CS-A241K**

Cooling	Outdoor Temp.(°C)											
Indoor Wet Bulb Temp.	30			35			40			46		
	TC	**SHC**	**IP**	**TC**	**SHC**	**IP**	**TC**	**SHC**	**IP**	**TC**	**SHC**	**IP**
17.0°C	6.32	5.74	2.83	5.93	5.55	3.05	5.55	5.16	3.26	5.03	4.45	3.51
19.0°C				6.45		3.08						
19.5°C	7.03	5.03	2.86	6.58	4.71	3.08	6.13	4.64	3.30	5.61	4.45	3.54
22.0°C	7.80	4.71	2.90	7.29	4.13	3.11	6.77	3.68	3.36	6.19	3.23	3.60

Heating	Outdoor Temp.(°C)											
Indoor Wet Bulb Temp.	30			35			40			46		
	TC	**SHC**	**IP**	**TC**	**SHC**	**IP**	**TC**	**SHC**	**IP**	**TC**	**SHC**	**IP**
17.0°C	7.64	6.94	2.91	7.18	6.71	3.13	6.71	6.24	3.35	6.08	5.38	3.60
19.0°C				7.80		3.16						
19.5°C	8.50	6.08	2.94	7.96	5.69	3.16	7.41	5.62	3.38	6.79	5.38	3.63
22.0°C	9.44	5.69	2.97	8.81	4.99	3.19	8.19	4.45	3.44	7.49	3.90	3.70

TC – Total Cooling / Heating Capacity (kW)
SHC – Sensible Heat Capacity (kW)
IP - Input Power (kW)

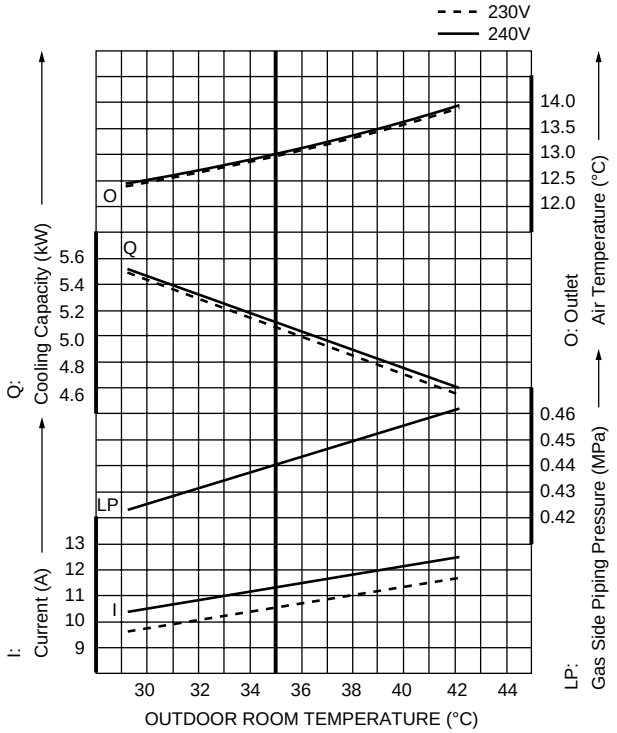
Indoor 27°C/19°C
Outdoor 35°C/24°C

Technical Data

■ Operation characteristics

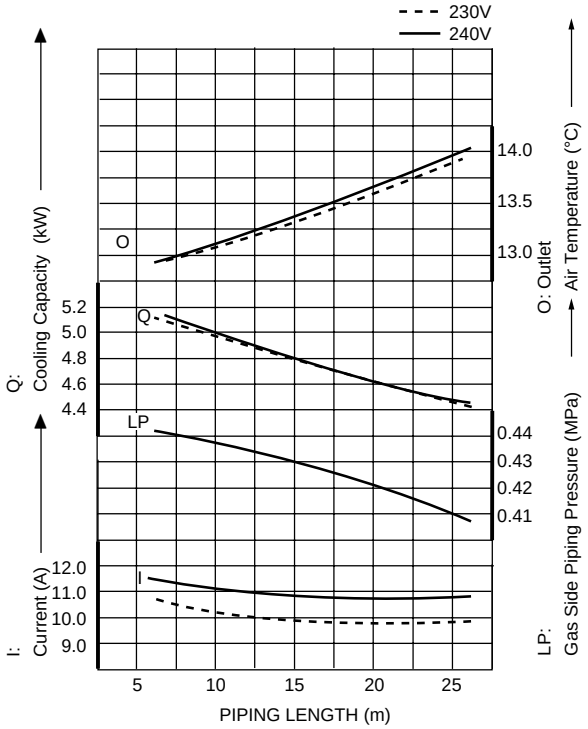
CS-A181K / CU-A181K

- **Cooling Characteristic**



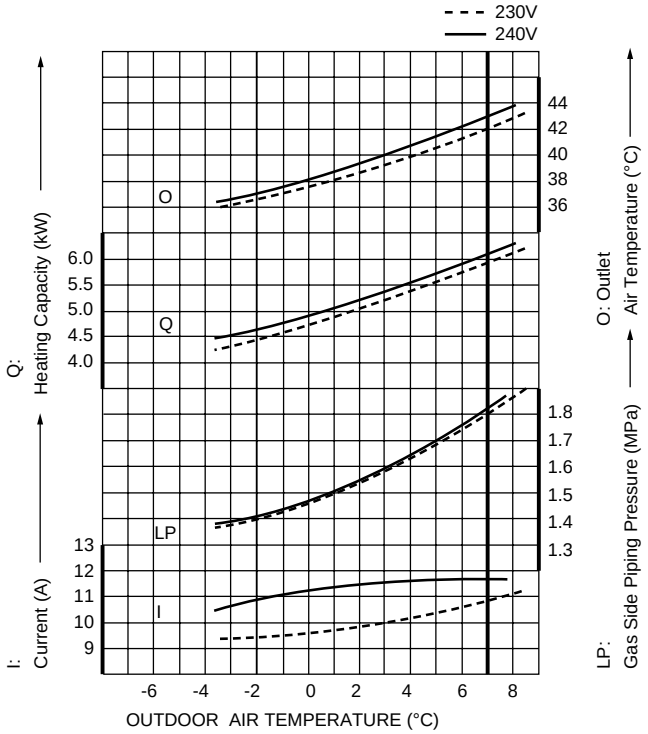
[Condition] Room temperature: 27/19°C
Cooling operation: High fan
Piping length: 7.5 m

- **Piping Length Characteristic (Cooling)**



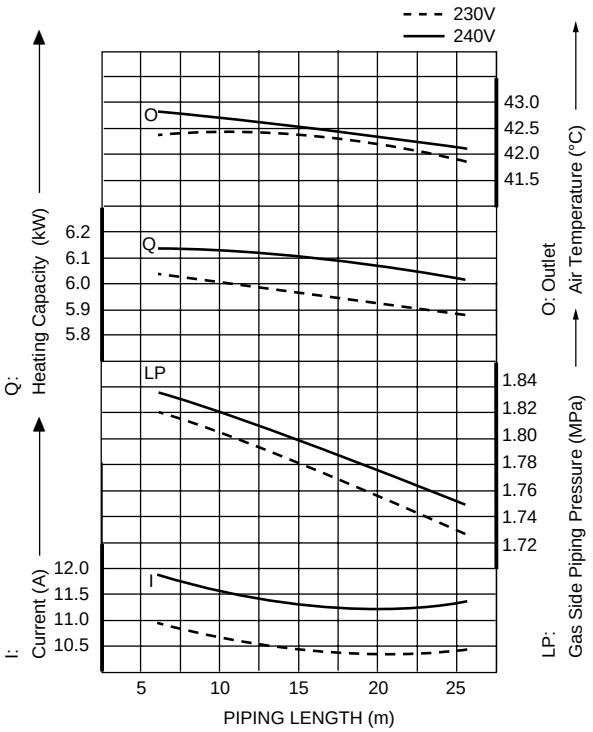
[Condition] Room temperature: 27/19°C
Outdoor air temperature: 35/24°C
Cooling operation: High fan

- **Heating Characteristic**



[Condition] Room temperature: 20°C
Heating operation:High fan
Piping length: 7.5 m

- **Piping Length Characteristic (Heating)**



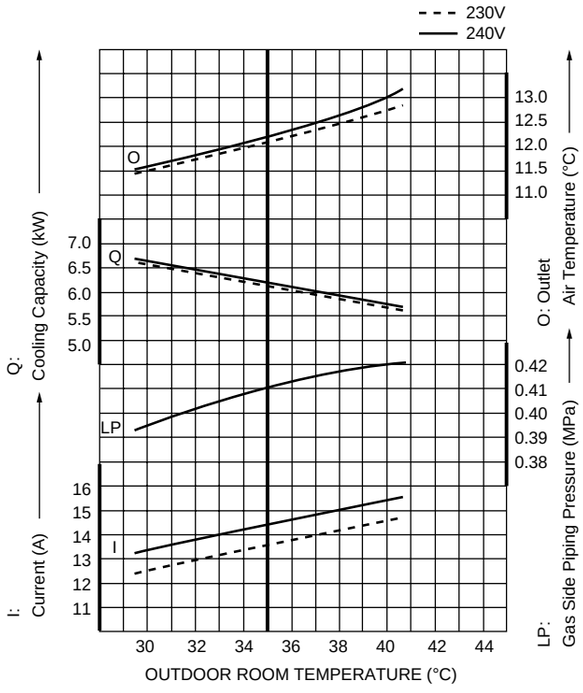
[Condition] Room temperature: 20°C
Outdoor temperature: 7/6°C
Heating operation: High fan

Technical Data

■ Operation characteristics

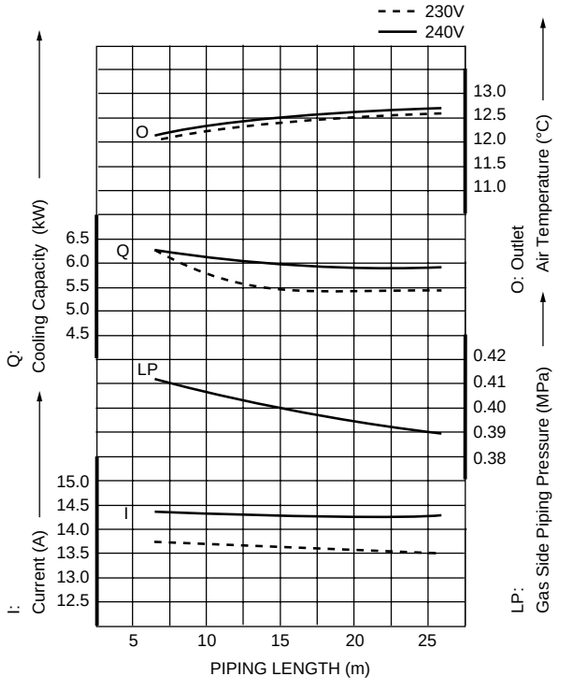
CS-A241K / CU-A241K

- **Cooling Characteristic**



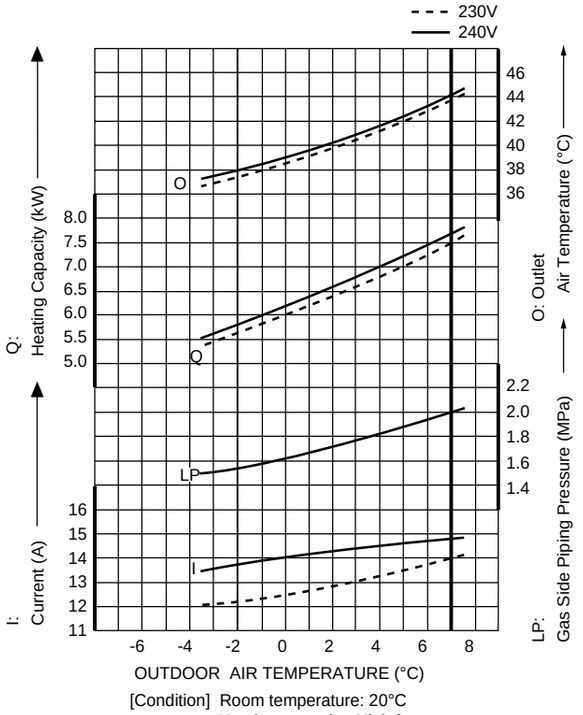
[Condition] Room temperature: 27/19°C
Cooling operation: High fan
Piping length: 7.5 m

- **Piping Length Characteristic (Cooling)**



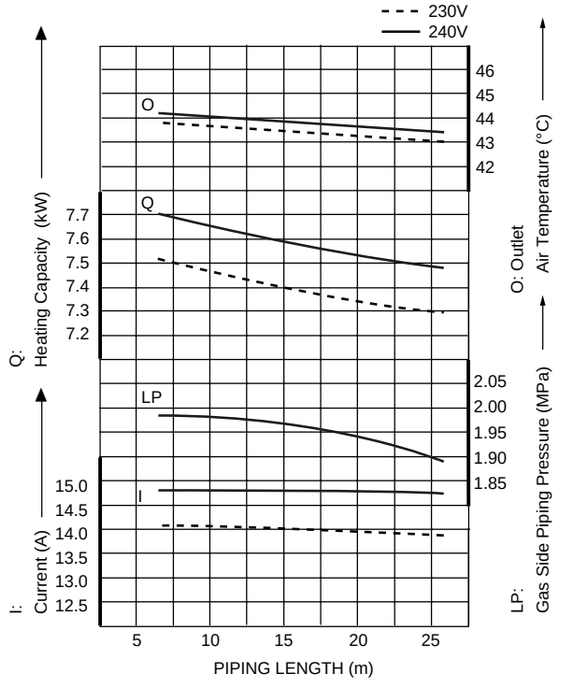
[Condition] Room temperature: 27/19°C
Outdoor air temperature: 35/24°C
Cooling operation: High fan

- **Heating Characteristic**



[Condition] Room temperature: 20°C
Heating operation:High fan
Piping length: 7.5 m

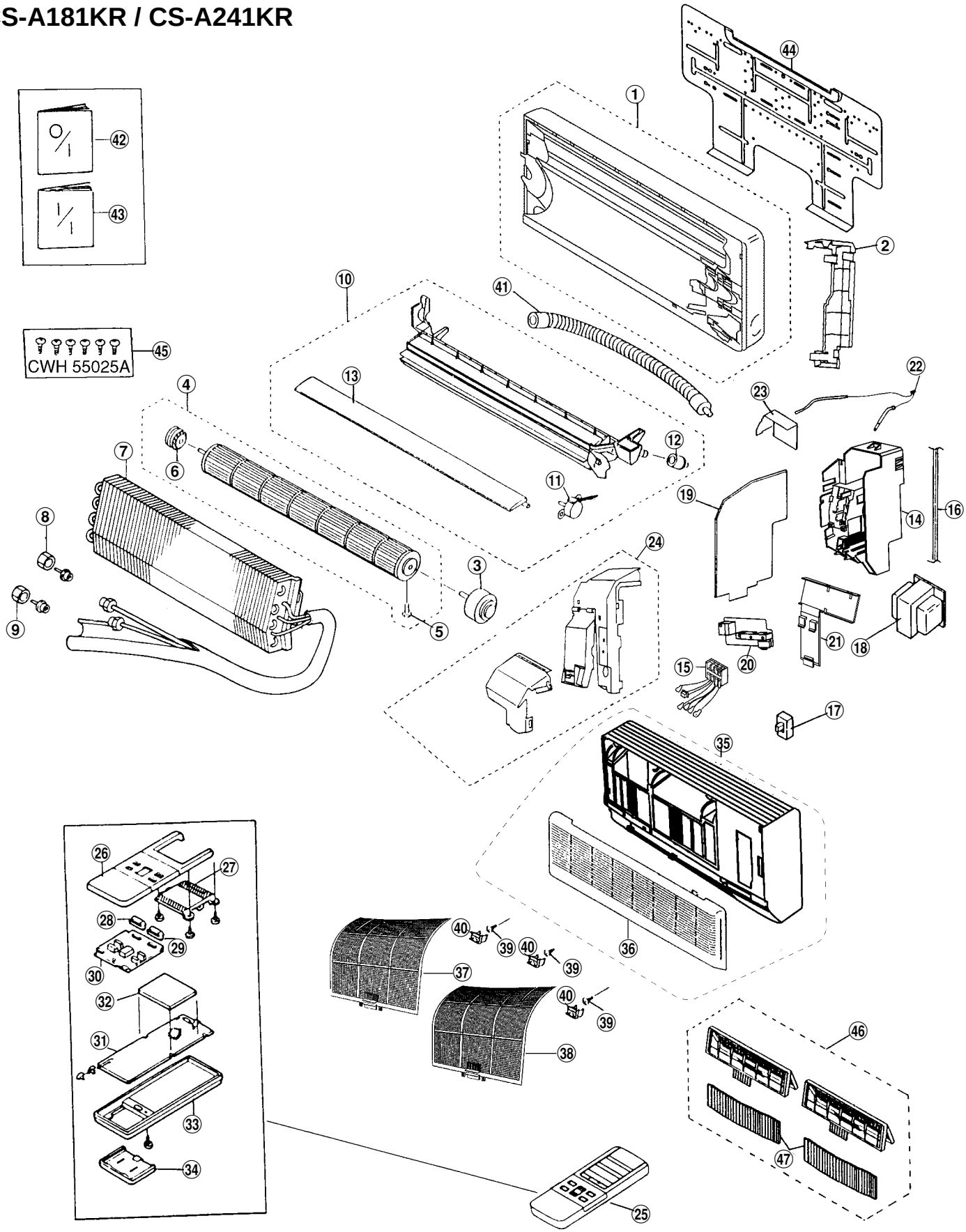
- **Piping Length Characteristic (Heating)**



[Condition] Room temperature: 20°C
Outdoor temperature: 7/6°C
Heating operation: High fan

Exploded View

CS-A181KR / CS-A241KR



Replacement Parts List

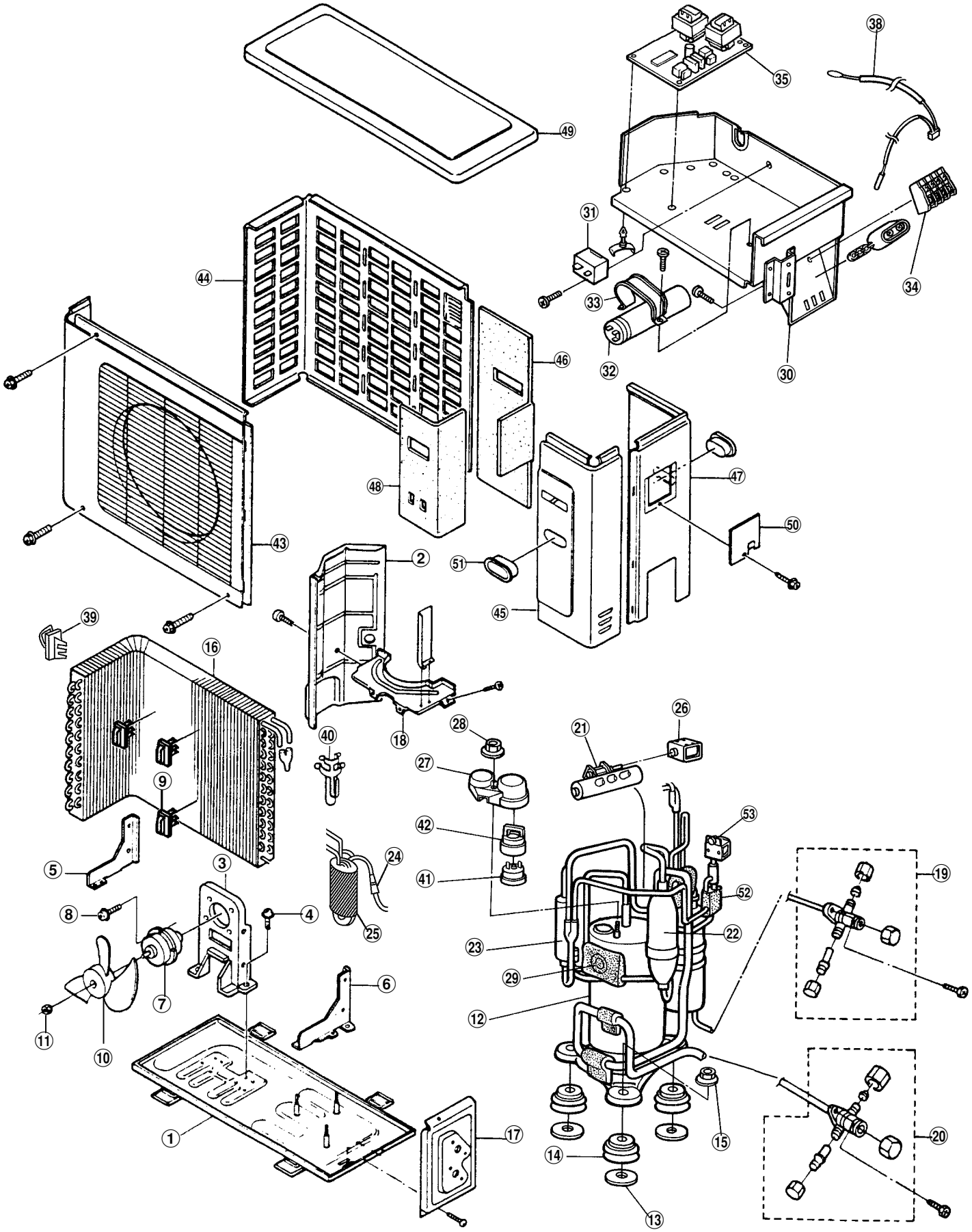
<Model: CS-A181KR / CS-A241KR>

NO.	DESCRIPTION & NAME	QTY	CS-A181KR	CS-A241KR	REMARKS
1	CHASSY COMPLETE	1	CWD50C369	←	
2	CHASSY BACK COVER	1	CWD93956	←	
3	FAN MOTOR	1	CWA98273	CWA98273	○
4	CROSS FLOW FAN COMPLETE	1	CWH02C058	←	
5	SCREW – CROSS FLOW FAN	1	CWH4580304	←	
6	BEARING ASS'Y	1	CWH64K007	←	
7	EVAPORATOR	1	CWB30C284	CWB30C285	
8	FLARE NUT (1/4")	1	CWH6002140	←	
9	FLARE NUT (1/2") OR (5/8")	1	CWT25007 (1/2")	CWT25004 (5/8")	
10	DISCHARGE GRILLE COMPLETE	1	CWE20C574	←	
11	MOTOR – AIR SWING	1	CWA98267	←	○
12	TAP – DRAIN TRAY	1	CWH4612103	←	
13	VANE	1	CWE24443	←	
14	CONTROL BOARD	1	CWH10943A	←	
15	TERMINAL BOARD COMPLETE	1	CWA28C584	CWA28C585	○
16	POWER SUPPLY CORD	1	CWA20C779	CWA20C780	
17	SLIDE SWITCH	1	CWA04088	←	○
18	TRANSFORMER COMPLETE	1	CWA40C246	←	○
19	ELECTRONIC CONTROLLER	1	CWA742082	CWA742083	○
20	RECEIVER COMPLETE	1	CWA742002	←	○
21	RECEIVER COMPLETE HOLDER	1	CWD93957	←	
22	SENSOR COMPLETE	1	CWA50C621	←	○
23	CONTROL BOARD TOP COVER	1	CWH13473	←	
24	CONTROL BOARD FRONT COVER	1	CWH13C320	←	
25	REMOTE CONTROL COMPLETE	1	CWA75C556	←	○
26	REMOTE CONTROL UPPER CASE	1	CWE15C241	←	
27	CONTROL PANEL	1	CWE311064	←	
28	KNOB	1	CWE17196A	←	
29	KNOB	1	CWE17197A	←	
30	CONTACTOR	1	CWA65036C	←	
31	ELECTRONIC CONTROLLER	1	CWA74224	←	○
32	INDICATOR	1	CWE39199	←	
33	REMOTE CONTROL LOWER CASE	1	CWE15128A	←	
34	COVER	1	CWB80040A	←	
35	FRONT GRILLE COMPLETE	1	CWE11C994	←	○
36	INTAKE GRILLE COMPLETE	1	CWE22C329	←	
37	AIR FILTER (LEFT)	1	CWD00232	←	○
38	AIR FILTER (RIGHT)	1	CWD00231	←	○
39	SCREW – FRONT GRILLE	3	XTT4+16C	←	
40	CAP – FRONT GRILLE	3	CWH52258	←	
41	DRAIN HOSE	1	CWH85178	←	
42	OPERATING INSTRUCTIONS	1	CWF561658	←	
43	INSTALLATION INSTRUCTIONS	1	CWF61716	←	
44	INSTALLATION PLATE	1	CWH36152	←	
45	BAG COMPLETE – INSTALLATION SCREW	1	CWH82C194	←	
46	AIR PURIFYING FILTER COMPLETE	1	CWD00C111	←	
47	AIR PURIFYING FILTER	2	CWD00220	←	○

(Note) ● All parts are supplied from MACC, Malaysia (Vendor Code: 086).
● ○ marked parts are recommended to be kept in stock.

Exploded View

CU-A181KR / CU-A241KR



Replacement Parts List

NO.	DESCRIPTION & NAME	QTY	CU-A181KR	CU-A241KR	REMARKS
1	CHASSY ASS'Y	1	CWD50K514B	←	
2	SOUND PROOF BOARD	1	CWH15223	←	
3	FAN MOTOR BRACKET	1	CWD54145	←	
4	SCREW - FAN MOTOR BRACKET	6	CWH55101	←	
5	PARTICULAR PLATE F/M (L)	1	CWD90835	←	
6	PARTICULAR PLATE F/M (R)	1	CWD90836	←	
7	FAN MOTOR	1	CWA92294	CWA92295	○
8	SCREW - FAN MOTOR	4	CWH55252	←	
9	HOLD FOR F/MOTOR & LEAD WIRES	3	CWH31043	←	
10	PROPELLER FAN	1	CWH00K050	←	
11	NUT - PROPELLER FAN	1	CWH56060	←	
12	COMPRESSOR	1	2JS350D3AA02	2JS464D3AA02	○
13	PACKING - COMP. MOUNT.	2	CWB81043	←	
14	ANTI - VIBRATION BUSHING - COMP. MOUNT.	3	CWH50055	←	
15	NUT - COMP. MOUNT	3	CWH4582065	←	
16	CONDENSER	1	CWB32C344	CWB32C345	
17	HOLDER - COUPLING ASS'Y	1	CWH35113B	CWH35114B	
18	GUIDER COMPLETE	1	CWD90830	←	
19	3 - WAYS VALVE (LIQUID)	1	CWB01495	←	○
20	3 - WAYS VALVE (GAS)	1	CWB01364	CWB01430	○
21	4 - WAYS VALVE ASS'Y	1	CWB00K028	CWB00K029	○
22	ACCUMULATOR ASS'Y	1	CWB13K011	CWB13K047	○
23	OIL SEPARATER ASS'Y	1	CWB16K032	CWB16K031	○
24	STRAINER	1	CWB11051	←	
25	TUBE ASS'Y (CAPILLARY TUBE, CHECK VALVE)	1	CWT01C671	CWT01C672	
26	V - COIL COMPLETE	1	CWA43C685	←	○
27	TERMINAL COVER	1	CWH17015	←	
28	NUT FOR TERMINAL COVER	1	CWH7080300	←	
29	TUBE ASS'Y (CAPILLARY TUBE)	1	CWT01808	←	
30	CONTROL BOARD ASS'Y	1	CWH10K421	←	
31	CAPACITOR - FAN MOTOR	1	CWA31244	CWA31621	○
32	CAPACITOR - COMPRESSOR	1	CWA31504	CWA31507	○
33	HOLDER - CAPACITOR	1	CWH30057	CWH30060	
34	TERMINAL BOARD ASS'Y	1	CWA28C382	←	○
35	ELECTRONIC CONTROLLER	1	CWA741314	CWA741315	○
38	SENSOR COMPLETE	1	CWA50C622	←	○
39	HOLDER - SENSOR	1	CWH32082	←	
40	HOLDER - SENSOR	1	CWH32074	←	
41	OVERLOAD PROTECTOR	1	CWA12262	←	○
42	HOLDER - OVERLOAD PROTECTOR	1	CWH34012	←	
43	CABINET FRONT PLATE COMPLETE	1	CWE06K034B	←	
44	CABINET REAR PLATE COMPLETE	1	CWE02096B	←	
45	CABINET FRONT PLATE COMPLETE	1	CWE06075B	←	
46	SOUND PROOF MATERIAL	1	CWG30539	←	
47	CABINET SIDE PLATE	1	CWE04111B	←	
48	SOUND PROOF MATERIAL	1	CWG30528	←	
49	CABINET TOP PLATE	1	CWE03101B	←	
50	CONTROL BOARD COVER	1	CWH13331A	←	
51	HANDLE	2	CWE16000E	←	
52	2 - WAYS VALVE	1	----	CWB02018	○
53	V - COIL COMPLETE	1	----	CWA43C494	○

(Note) ● All parts are supplied from MACC, Malaysia (Vendor Code: 086).
● ○ marked parts are recommended to be kept in stock.

Electronic Parts List

Electronic Controller : CWA742082 (CS-A181K)
Electronic Controller : CWA742083 (CS-A241K)

SYMBOL	DESCRIPTION & NAME	PART NO.
IC1	INTEGRATED CIRCUIT	A52D011W216
IC2	INTEGRATED CIRCUIT	A52C096
IC3	INTEGRATED CIRCUIT	A52C050
IC4	INTEGRATED CIRCUIT	A52MPA2003C
IC5	INTEGRATED CIRCUIT	A52BR9020
IC6	INTEGRATED CIRCUIT	A52MPC393C
IC7	INTEGRATED CIRCUIT	A52BX8315
PC	PHOTO COUPLER	A52LP620-G4
Q1	TRANSISTOR	A55C130
Q2	TRANSISTOR	A55D2220QTA
Q3, Q5, Q7~Q9, Q13 ~ Q15	TRANSISTOR	A55DTC114EST
Q4	TRANSISTOR	A55C1740STPQ
Q6	TRANSISTOR	A55C1741ASTR
Q10 ~ Q12	TRANSISTOR	A55DTA143XST
Q16	TRANSISTOR	A52C071
Q17	TRANSISTOR	A52C070
DB1	DIODE BRIDGE	A54D3SBA60F1
DB2	DIODE BRIDGE	A54CS1VB20E
D1	DIODE	A54RB44-08V
D2	DIODE	A54C198
D3	DIODE	A541SS131T
D6	DIODE	A54RA15-01KB
D7 ~ D13, D16 ~ D23	DIODE	A54MA165TA5
D24	DIODE	A54MA723TA
ZD1	ZENER DIODE	A54D8.2EL2TB
ZNR1, ZNR2	ZNR	A54C353
L1	V - COIL	A43101T
L2 ~ L6	V - COIL	A43036
LF1	NOISE FILTER	A49219
LF2	NOISE FILTER	A49220
T1	TRANSFORMER	A401005(CS–A181K ONLY), A40287(CS–A241K ONLY)
T2	TRANSFORMER	A40263
RY - HOT	RELAY ELECTRO MAGNETIC	A00161
RY - PWR	RELAY ELECTRO MAGNETIC	A00106
SW1	SLIDE SWITCH	A04042
SW2, SW3	PUSH SWITCH	A01059
FUSE	FUSE	XBA2C31TR0
X1	RESONATOR	A45ST8.0MTWT
BZ	BUZZER (SOUND GENERATOR)	A48039
VR1	VARIABLE RESISTOR	A44EVMEASB52
FUSE	FUSE COMPLETE	A16C204

(Note) ● All parts are supplied from MACC, Malaysia (Vendor Code: 086).

Electronic Parts List

Electronic Controller : CWA741314 (CU-A181K)
Electronic Controller : CWA741315 (CU-A241K)

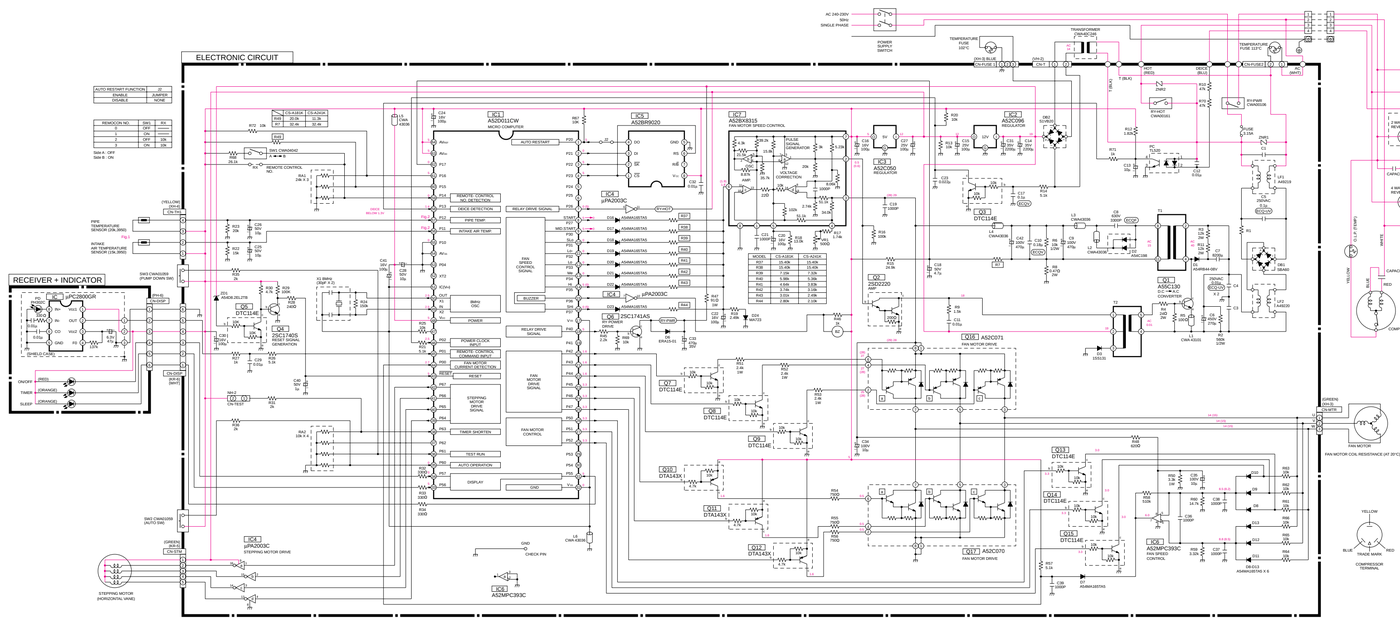
SYMBOL	DESCRIPTION & NAME	PART NO.
IC1	INTEGRATED CIRCUIT	A52C78414Y
IC2	INTEGRATED CIRCUIT	A52C094
IC3	INTEGRATED CIRCUIT	A52C040
IC4	INTEGRATED CIRCUIT	A52MPA2003C
Q1	TRANSISTOR	A55C1740STPQ
Q2	TRANSISTOR	A55DTC113ZST
D1 ~ D6	DIODE	A54MA165TA5
DB1, DB2	DIODE BRIDGE	A54CS1VB20E
ZD1	ZENAR DIODE	A54D7.5EL1TB
ZNR2 ~ ZNR4	ZNR	A54C353
T1, T2	TRANSFORMER	A40378
CR1	SURGE ABSORBER	A59014
CR2	SURGE ABSORBER	A59014 (CU-A241K ONLY)
RY-HOT	RELAY	A00160
RY-DEICE	RELAY	A00160
RY-OFF	RELAY	A00160
RY-H/L	RELAY	A00160
RY-V	RELAY	A00160 (CU-A241K ONLY)
FUSE	FUSE	XBA2C31TR0
X1	RESONATOR	A45ST4.0MGWT

(Note) ● All parts are supplied from MACC, Malaysia (Vendor Code: 086).

CS-A181K/A241K CS-A181K/A241K

ELECTRONIC CIRCUIT DIAGRAM

- CS-A181K / CU-A181K SERIES
- CS-A241K / CU-A241K SERIES



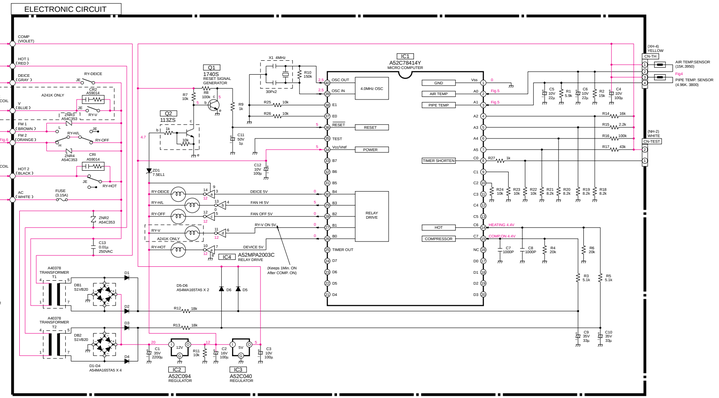


Fig. 1

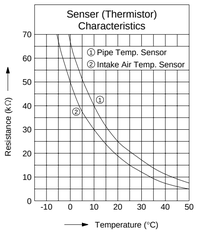


Fig. 2

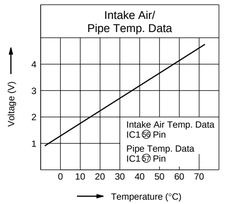


Fig. 5

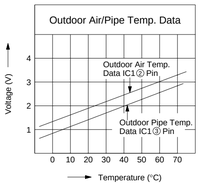


Fig. 4

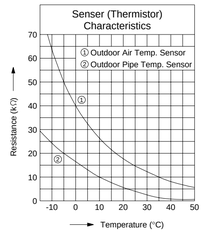


Fig. 6

OUTDOOR TEMP.	RISES		FALLS	
COOLING	OVER 29°C	Hi	OVER 31°C	Hi
SOFT DRY	BELOW 29°C	Lo	BELOW 31°C	Lo
HEATING	BELOW 15.5°C	Hi	BELOW 13.5°C	Hi
	OVER 15.5°C	Lo	OVER 13.5°C	Lo

Fig. 3 Indoor Fan Speed

Fan Speed		High Speed ↔ Low Speed								
No.		8	7	6	5	4	3	2	1	0
Cooling	Manual		○	○	○					
	Auto		○	○			○			○
	Sleep					○				
Soft Dry	Manual, Auto						○			○
	Sleep					○				
Heating	Manual (A181K)	○		○	○					
	Manual (A241K)	○	○	○						
	Auto			○	○	○	○			○
	Sleep					○	○			○
Voltage to Fan Motor Drive Transistor (DCV)	CS-A181K	44.0	42.0	36.3	31.2	25.3	21.0	8.0	8.0	0
	CS-A241K	52.8	47.8	41.4	36.3	28.0	21.1	8.0	8.0	0
		SHi	Hi	Me	Lo	Lo-	SLo	START 2	START 1	STOP

CS-A181K/A241K CS-A181K/A241K

How to use electronic circuit diagram

Before using the circuit diagram, read the following carefully.

* Voltage measurement
  Voltage has been measured with a digital tester when the indoor fan is set at high fan speed under the following conditions without setting the timer.
  Use them for servicing.
  Voltage indication is in Red at all operations.

	Intake air temperature	Temperature setting	Discharge air temperature	Pipe temperature
Cooling	27°C	16°C	17°C	15°C
Heating	20°C	30°C	40°C	50°C

* Indications for resistance
  a. K.... kΩ M ... MΩ
  W... watt Not indicated 1/4W
  b. Type
  Not indicated ..... carbon resister Tolerance±5%
  ..... metal oxide resister Tolerance±1%

* Indications for capacitor
  a. Unit μ.... μF P .... pF
  b. Type Not indicated ... ceramic capacitor
  (S) ..... S series aluminium electrolytic capacitor
  (Z) ..... Z series aluminium electrolytic capacitor
  (SU) ..... SU series aluminium electrolytic capacitor
  (P) ..... P series polyester system
  (SXE) ..... SXE series aluminium electrolytic capacitor
  (SRA)..... SRA series aluminium electrolytic capacitor
  (KME).....KME series aluminium electrolytic capacitor

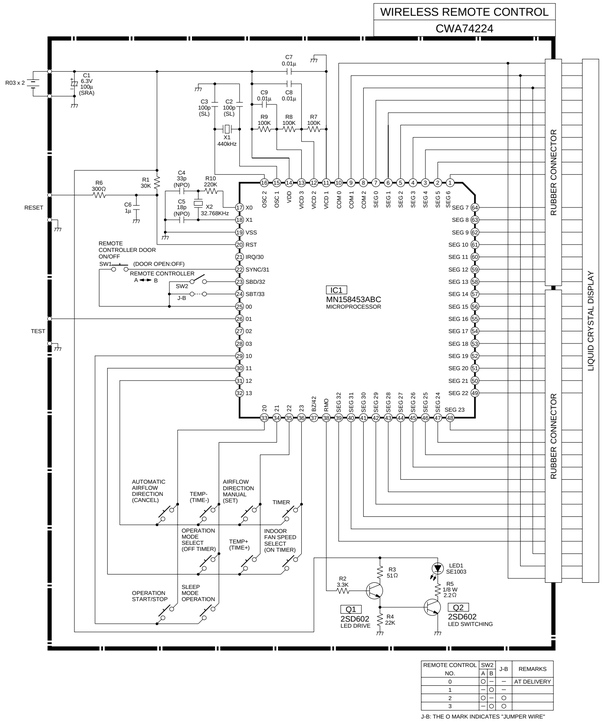
* Diode without indication MA165
※ Circuit Diagram is subject to change without notice for further development.

TIMER TABLE

Name		Time	Test mode (When test point Short-circuited)	Remarks
Sleep Mode Waiting		1 hr.	6 sec.	
Sleep Mode Operation		8 hrs.	48 sec.	
Real Timer		1 hr.	1 min.	
		10 min.	10 sec.	
		1 min.	1 sec.	
Time Delay Safety Control		2 min. 58 sec.	0 sec.	
Forced Operation		60 sec.	0 sec.	
Time Save Control		7 min.	42 sec.	
Anti-Freezing Control		4 min.	0 sec.	
Mode Juggdement		20 sec.	0 sec.	
Soft Dry	Off	6 min.	36 sec.	
	On	10 min.	60 sec.	SOFT DRY: 10 min. operation
Deodorizing Control	Cooling	40 sec	4 sec.	Comp. ON
		70 sec.	7 sec.	Comp. ON
		20 sec.	2 sec.	Comp. OFF
		180 sec.	18 sec.	Comp. OFF
	Soft Dry	40 sec.	4 sec.	Comp. ON
		360 sec.	36 sec.	Comp. OFF
Indoor Fan Step Change		1 sec.	0 sec.	
After Deice Ended		30 sec.	3 sec.	Comp. OFF, F/Motor ON
4-Way valve		5 min.	30 sec.	

ELECTRONIC CIRCUIT DIAGRAM

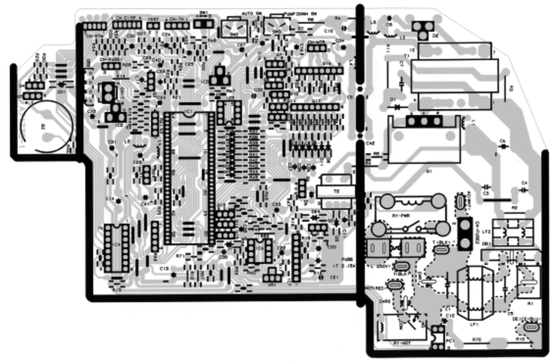
● REMOTE CONTROL



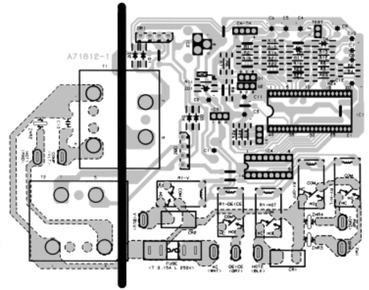
REMOTE CONTROL NO.	SW2 A	SW2 B	J-B	REMARKS
0	O	–	–	AT DELIVERY
1	–	O	–	
2	O	–	O	
3	–	O	O	

J-B: THE O MARK INDICATES "JUMPER WIRE"

PRINT PATTERN
INDOOR UNIT PRINTED CIRCUIT BOARD



PRINT PATTERN
OUTDOOR UNIT PRINTED CIRCUIT BOARD



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